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# A Statistical Study of the Influence of Increased Instructional Time on Underperforming Students' Achievement Scores in Grade 7 and 8 Mathematics and English Language Arts

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A STATISTICAL STUDY OF THE INFLUENCE OF INCREASED INSTRUCTIONAL TIME  
ON UNDERPERFORMING STUDENTS' ACHIEVEMENT SCORES IN GRADE 7 AND 8  
MATHEMATICS AND ENGLISH LANGUAGE ARTS

by

ANDREW TRUST

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Submitted in Partial Fulfillment  
of the Requirement for the Ed.D. in  
Educational Leadership, Management and Policy  
Seton Hall University

2015

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**SETON HALL UNIVERSITY**  
**COLLEGE OF EDUCATION AND HUMAN SERVICES**  
**OFFICE OF GRADUATE STUDIES**

**APPROVAL FOR SUCCESSFUL DEFENSE**

Doctoral Candidate, **Andrew Trust**, has successfully defended and made the required modifications to the text of the doctoral dissertation for the **Ed.D.** during this **Fall Semester 2014**.

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The mentor and any other committee members who wish to review revisions will sign and date this document only when revisions have been completed. Please return this form to the Office of Graduate Studies, where it will be placed in the candidate's file and submit a copy with your final dissertation to be bound as page number two.

## ABSTRACT

### A STATISTICAL STUDY OF THE INFLUENCE OF INCREASED INSTRUCTIONAL TIME ON UNDERPERFORMING STUDENT'S ACHIEVEMENT SCORES IN GRADE 7 AND 8 MATHEMATICS AND ENGLISH LANGUAGE ARTS.

**Background:** Educational Systems across the country have been put under enormous amounts of pressure to improve student performance in their schools. Recently, New York State has required that struggling students, as defined by results of standardized tests, be given increased instructional time to make up for the deficits that they may possess.

**Purpose:** To determine the efficacy of the academic intervention classes being offered within a school district.

**Setting:** Large middle school in New York State

**Subjects:** Two hundred four 7<sup>th</sup> grade students and one hundred ninety eight 8th grade students.

**Treatment:** All of the students were enrolled in an academic intervention class based upon their previous year's score on a New York State English Language Arts or Mathematics examination. A logistic regression was run using SPSS to determine if the students' enrollment in the academic intervention class had an impact on their chance of scoring in the proficient range on the subsequent New York examination.

**Research Design:** Correlational, quantitative study

**Findings:** It was found that attendance in an academic intervention class has no statistically significant impact on the chances that a student will perform better on subsequent examination. The only statistically significant predictor of student performance on subsequent examinations was performance on past examinations.

**Conclusion:** While statistically significant results were not found related to attendance, the study did show that the best predictor of future student performance is past performance.

Administrators and teachers alike may be able to use this information to start to analyze the curriculum that is taught in the academic intervention classes, and tailor it to individual student needs based upon the areas of past tests that the students have struggled.

### **Acknowledgements**

My mentor Dr. Robert Starratt, aka Jerry, was instrumental in keeping me on track with his guidance, knowledge and ability for a quick turn around when editing. His guidance was pivotal in conducting my study.

Many thanks to Dr. Debra Thomas, who has been more than a significant influence in my educational career. Dr. Thomas's work at the Rockland Teachers Center has helped create a steady flow of energetic highly qualified teachers into the field. I appreciate all she has done for my career, well beyond her contribution on my study.

I would also like to thank Dr. Tienken. Dr. T has guided me not only through the writing process, but also through my whole doctoral journey. He has a clear understanding on how to work with people, and is one of the most approachable and kind people I have ever met. Dr. Tienken is a pioneer in education and I am proud to say that I learned so much from him. In addition, his taste for fashion is unmatched.

## **Dedication**

This work is dedicated to my loving wife Jeanette. Her support through this whole process has been incredible. She has motivated me (mostly by fear) so that I knew not finishing was not an option. Jeanette, you have made me a better person in life, and now you have helped make me a better person in my profession. I have never loved you more than I do right now.

This work is also dedicated to my parents who have long instilled in me a desire to achieve to the highest levels. My mother Judith and father William have been the consummate parents. It may have taken longer than expected, but I finally followed mom's advice; she saw in me what others did not, that I was destined to become an educational leader. Thanks mom.

To my three beautiful children, Peter, Brendan and Maeve; when I first entered Seton Hall I had no children and was loving life with my beautiful bride. Over the course of the last four years, you three have come into our lives and made me realize that a parent's love for a child is a feeling that is completely unmatched in life. I love you all very much.

Finally, I would like to thank Chad Corey and Mike St. John. Our Rockland cohort of three was the exact thing I needed to make it through all those late night drives and long classes. Without our conversations, commentary and laughter, I don't think any of us would have made it. We did it boys!

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## CHAPTER I AN OVERVIEW OF THE STUDY

### Introduction

In this era of high-stakes testing, states implemented mandated tests in mathematics, language arts, and science, in various grade levels to monitor student progress and evaluate teachers and school administrators. Considering that New York State implemented its first Regents tests in 1866 (Watson, 2010), this practice of testing is not a new idea. However, the policies that mandate that all students in grades 3 through 8 and at least once in high school must be tested, and that those results should be used to evaluate teachers and school administrators is an evolution of previous policy mandates.

As a result of this new pressure to have students score better on the state exams, teachers and school administrators in New York school districts seek ways to help their students perform better on standardized tests. District administrators in all New York public schools developed programs to offer Academic Intervention Services (AIS) to aide struggling students in hopes that their achievement on state mandated tests would improve. Academic Intervention Services, according to the New York State United Teachers (2011), are learning services that are designed to help students improve achievement. The services are typically provided in addition to the time the student spends exposed to regular instruction. The classes go by various names, such as Academic Intervention Services (AIS), Basic Skills Instruction (BSI), Instructional Learning Labs, Skills Support, and Supplemental Education Programs (SEP), but the goal is the same.

The New York State Education Department defines *academic intervention services* as additional instruction that supplements the instruction provided in the general curriculum and assists students in meeting the state learning standards and may include guidance, counseling,

attendance, and study skills which are needed to support improved academic performance (NYSED, 2008).

The federal government passed the Elementary and Secondary Education Act (ESEA) of 1965 as the earliest steps towards providing compensatory educational services to low performing students. The act commonly known as Title I is responsible for the majority of the funding to support compensatory services (D'Agostino, 1996). In 2004, the federal government passed the No Child Left Behind (NCLB) and revised the Individuals with Disabilities (IDEA) mandates. These mandates put more pressure on the school systems by raising expectations and making schools responsible for ensuring that students do in fact show growth (Fuchs & Fuchs, 2006). To monitor the students' progress states administer achievement exams throughout the educational careers of the students.

Madaus and Russell (2010) states that students entering kindergarten will take a minimum of 16 high-stakes state assessments before graduating from high school. Some of these students will have learning disabilities which may put them at a disadvantage when faced with these exams as compared to students who do not have a learning disability. IDEA requires school districts to use research-based interventions when they are trying to improve a student's chance at scoring in the proficient range on the achievement exams.

### **Statement of the Problem**

The implementation of these testing mandates has put public school personnel across the country under an enormous amount of pressure to raise the level of standardized test scores in their buildings and districts. With the addition of the national standardized testing in more than 35 states, the landscape of education across the country has been altered. State bureaucrats have

begun to adopt new examinations that are designed to evaluate students on the new Common Core State Standards.

In 2004, the reauthorization of the IDEA stated that there is a continued expectation that students with special needs take the same standardized tests and achieve at the same levels of their peers that do not have special needs (Madaus and Russell, 2010). As a result, many students with special needs in New York state schools are placed in academic intervention classes to give them additional support to prepare for the state mandated standardized tests.

In some cases general education students have received low scores on state assessment exams, which, in turn, resulted in them being placed in the remediation classes as well. The goals of various types of AIS classes are all the same: to account for a student's deficit and give him or her more of an equal opportunity to score in the proficient range on the state exams.

This study examined the influence, that a regular education student's mere presence in an academic intervention program has on the odds of that particular student achieving proficiency on subsequent NYS seventh or eighth grade math and ELA exams. The curriculum in these programs varies from teacher to teacher and district to district, but all districts in New York State have them. This research examined the efficacy of the academic intervention programs to increase the general education student's odds of performing better on a state test.

School districts are allotting time, teachers, and money for academic intervention classes with little empirical data to support whether the classes actually produce their proposed effect. School authorities know that they have a problem with students not scoring at the proficiency level on the state exams. Those same officials then make decisions to place students into academic intervention classes in order to improve their achievement and test scores. Little quantitative evidence exists since the inception of the Common Core State Standards regarding

the influence of academic intervention classes on students' chances of achieving proficiency on state mandated tests in mathematics and language arts in grades 7 and 8. Practically speaking, administrators need to know whether their programs deliver on the expectation that students will perform better and if these programs are worth the costs?

The study utilized a logistic regression to determine the influence of the academic intervention classes on the odds that the students present in the classes will score in the proficient range on the subsequent New York State ELA and Math exams. Logistic regression is appropriate for examining the predictive power of one or more predictors when the outcome variable is dichotomous or the result is divided in to two parts (Agesti & Finlay, 2009). In the case of this study, the dichotomous variable is the outcome of the exam: Did the student score proficient or not? A logistic regression will help to provide the probability of a student scoring in the proficient range based upon his or her presence in an academic intervention class. The regression helped me to determine the odds of scoring in the proficient range for students who were enrolled in academic intervention classes, as well as the odds for those students who were not enrolled in AIS classes. If the odds are equal then there is an argument that can be made that the AIS classes make up for the deficit that the students enrolled in them may have. If the odds of students who are not in the AIS classes still outweigh those that are enrolled in the classes, then an argument can be made to the contrary, that the AIS classes are not doing their job.

In any case, the information obtained from the study is a valuable tool for administrators making decisions about offering these types of classes in the hopes that they improve their school's proficiency rate. If the odds are in favor of the AIS classes, then there is a much stronger justification for scheduling students in these classes. If the odds are not in favor of the

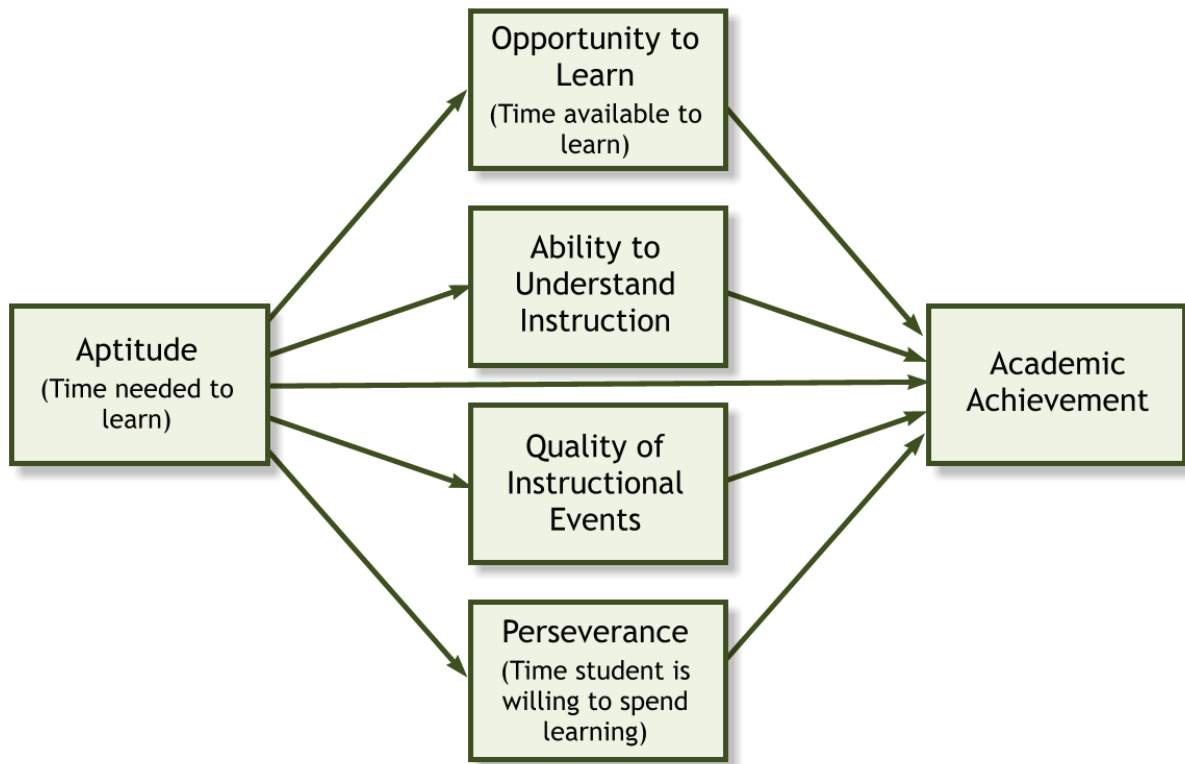
AIS classes, then districts have more evidence to present to leaders at the state level that these provisions are not working and therefore not worth the cost.

### **Theoretical Framework**

The basis for this study comes from John Carroll's model for school learning (Carroll, 1989) shown in Figure 1. Carroll's theory states that there are five separate variables that account for the variance in student learning; aptitude, opportunities for learning, ability to understand instruction, quality instruction, and perseverance. Increased opportunity for learning is often debated among researchers and administrators, but is widely considered valuable among teachers (Smith, Rodrick, & Degner 2005). The opportunity variable in Carroll's model refers to the time on task that students have during the day (Carroll, 1989). The instructional day consists primarily of two types of time; "time on task" and "allocated time." The amount of time that students actually spend on academic learning is the smallest part of their day; the larger part of the day is taken up by non-instructional activities that have little effect on student learning (Aronson, Zimmerman, & Carlos, 1998). Aronson et al. (1998) suggested that increasing the amount of time that students have to work on academic tasks would go a long way towards



increasing their achievement.



*Figure 1.* Carroll's model of school learning.

When looking at time spent, Carroll viewed the variables of opportunities for learning and perseverance as its make up. He measured perseverance by the amount of time students spend on task and opportunity is measured by the amount of time that is left for academic instruction in the classroom (Reeves & Reeves, 1997).

### **Aptitude**

Aptitude is viewed as a gauge of the time a student will need to acquire a new skill or concept. Aptitude can be credited to both nature and nurture. A learner may inherently know more about a subject because he or she could be predisposed to through genetics. A student's aptitude can be encouraged when an interest is stimulated and supported through family relationships and activities. Aptitude is also affected by a person's prior knowledge of a subject.

People who have even a small amount of knowledge of a skill or concept will be able to build upon that knowledge more quickly than those who do not have any knowledge base. Conversely, those students who lack prior knowledge will require additional learning time (Reeves & Reeves, 1997).

### **Opportunities for Learning**

This variable of Carroll's model refers to the amount of time in a school day or curriculum that is devoted to learning. Aronson, Zimmerman, and Carlos (1990) believe that academic learning time is the smallest part of the instructional day. The instructional day consists primarily of allocated time and on task time, but the time a student is actually engaged in learning through instruction is very limited. Carroll (as cited in Reeves & Reeves, 1997) believed that the way the school day and year are designed provide fewer opportunities for learning for students with lower aptitude

### **Ability to Understand Instruction**

Understanding is related to comprehension skills and can be acquired over time by the learner. Students who have strong learning skills will be able to understand instruction more quickly than students with weaker learning skills. Learning skills can be increased in students through readiness and study skills that are already present (Reeves & Reeves, 1997).

### **Quality of Instruction**

According to Carroll instructional designs must include specific methods and techniques. He believes that instruction not only is a series of lessons that encourages drills and practice, but also can include outside experiences from tutoring to class trips. High quality instruction should always be organized, complete, and clear. This will allow a student to learn information in a logical order and will connect the information a learner already knows to information that they

are getting ready to learn. The instruction should mirror the order in which the information is going to be taught. If the concepts A, B, and C are to be taught, organized instruction would teach A before B and B before C. Complete instruction ensures that all of the information a student needs to learn is available, and clarity removes irrelevant information from instruction (Reeves & Reeves, 1997).

### **Perseverance**

This variable is the student motivation factor, and it refers to the time that a student devotes to learning a new skill or concept. Motivation can be intrinsic, meaning that a student is inherently interested in a subject and spends time learning about that subject without prompting. The student is driven by internal factors. Extrinsic motivation drives the student to achieve mastery of a skill or concept through the use of tangible rewards. The student is driven by external factors (Reeves & Reeves, 1997).

In addition to John Carroll's model (1989), James Coleman's study of "Equality of Education Opportunity" (1966) helped shed more light on the impact of socioeconomic status (SES) on achievement. The study, more commonly referred to as *The Coleman Report*, set out to determine how funding differences between White and Black schools affected student achievement. Coleman discovered that the funding differences between White and Black schools was not as wide as expected and, furthermore, that funding had less of an effect on student achievement than previously thought. Coleman discovered that, more than funding a student's socioeconomic status, coupled with peer socialization, played a much larger role in a student's achievement.

Coleman went on to discuss the two findings. In 1966, at the time of the report, districts were still going through the desegregation process. The report was viewed as more artillery to

end school segregation (Kahlenberg, 2001). The influence that family and peers had on the academic achievement outweighed the influence of the amount of money invested by the school board. Kahlenberg (2001) noted that Colman concluded that the influence of peers was stronger because of the desire to gain approval from those peers. Also, Coleman went on to state that the curriculum in the middle class school was likely to be more rigorous, and would create more opportunities to learn for those attending the middle class school.

### **Purpose of the Study**

My purpose for this correlational, quantitative study is to determine the efficacy of the academic intervention classes that are being offered within a school district. More specifically, I sought to determine whether the mere attendance at these additional instructional sessions, irrespective of who taught them, improved the odds of achieving the proficient level on state mandated tests in grades 7 and 8 for those students. Although all schools in the state offered these classes, there was no set curriculum for the content that was supposed to be taught. Within the middle school studied the AIS classes were not taught by the same person. Different teachers, with different skill sets, from each department were responsible for the classes. Additionally, the classes were not part of the regular teaching load, therefore, the teachers could not be observed while teaching the AIS classes. By focusing on seventh and eighth grade students from the same large middle school, who were assigned to the AIS classes at the beginning of the school year grade based on their exam scores from the previous year, and who remained in the AIS class for the full school year culminating with their current years NYS exam. I hoped to determine the impact that enrollment in the AIS classes had on the odds of students scoring in the proficient range on the subsequent New York State assessment. Academic intervention services have been offered in middle schools throughout the state for

many years, but after the results of the 2013 NYS English Language Arts and Math Examinations the state mandated that any student who scored below the proficient range be scheduled into these classes. As a result, schools now have more students who are taking these classes and missing out on opportunities to take other classes that might interest them.

The findings of the study will either confirm a statistically significant influence on improved students' New York State test scores after 1 year of academic intervention or confirm that there is no statistically significant impact of AIS on the New York State examinations. This information would then be able to be used to develop building decisions based upon the data. If it is established that attendance in the classes does not have a statistically significant impact on scores, then educators can begin to focus on other aspects of the classes to improve scores. Evidence does exist about multiple variables that affect student achievement, but there is little evidence connecting attendance in supplemental education programs affecting student achievement. The expectation is that this study will add to the limited evidence available, and help district administrators when making decisions about scheduling these types of classes.

### **Research Questions**

The study was developed to explore the following overarching research question: What is the efficacy of the academic intervention classes in terms of increasing the odds of scoring in the proficient range on a state examination, as measured by New York State seventh and eighth grade English Language Arts and Math examinations?

Research question 1: How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 8 English Language Arts examination for the 2013-14 school year?

Research question 2: How well does enrollment in a math academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 8 Math examination for the 2013-14 school year?

Research question 3: How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 English Language Arts examination for the 2013-14 school year?

Research question 4: How well does enrollment in a math academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 Math examination for the 2013-14 school year?

### **Null Hypotheses**

Null hypotheses 1: Enrollment in an English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 English Language Arts examination for the 2013-14 school year?

Null hypotheses 2: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 Math examination for the 2013-14 school year?

Null hypotheses 3: Enrollment in an English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 English Language Arts examination for the 2013-14 school year?

Null hypotheses 4: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 Math examination for the 2013-14 school year?

### **Variables**

The independent or predictor variable is attendance in academic intervention classes, while the dependent or outcome variable is the score on the subsequent assessment exam. In order for a logistic regression to work the dependent or outcome variable needs to be dichotomous and exclusive, or have one of two results. In this case, the dichotomy was represented by students either scoring in the proficient range or the not-proficient range on the state exams. The goal of using the logistic regression was to determine if there was a relationship between attendance at additional instructional sessions and proficiency. The study did not seek to predict scale scores on the NYS seventh or eighth grade math or ELA tests, but to predict if the students' subsequent raw scores fell in the proficient range.

### **Sample and Data Collection**

The sample for this study was drawn from 2012-13 general education students in grades 7 and 8 who met the following requirements.

There was no requirement for an even amount of male and female students. The students who were being studied were regular education students who scored below the proficiency cutoff score, and this required that they be enrolled in the AIS classes for the entire subsequent school year. The seventh grade students were placed in the AIS classes based upon their sixth grade NYS Math or ELA exam scores. The eighth grade students were placed in the AIS classes based upon their seventh grade NYS Math or ELA exam score. The sample population was

unbalanced because the population was determined by their enrollment in the AIS classes, not me.

Data were collected in May of 2013 from student samples that met the following criteria:

- continued enrollment in the middle school from the beginning of sixth grade beginning in 2011;
- enrollment in the AIS classes for the entire school year;
- seventh graders must have taken both the 2012 NYS grade 6 English or Math Exam and the subsequent 2013 grade 8 English or Math Exam;
- eighth graders must have taken both the 2012 NYS grade 7 English or Math Exam and the subsequent 2013 grade 8 English or Math Exam;
- Students were classified General Education or Special Education;
- seventh graders obtained a valid score in the not-proficient range on the sixth grade NYS English Language Art or Math examinations or both; and
- eighth graders must have obtained a valid score in the not-proficient range on the seventh grade NYS English Language Art or Math examinations or both.

The study examined seventh and eighth grade students who took the previous year's NYS examination (either sixth or seventh grade) and the current year's examinations (either seventh or eighth grade). Also, the students must have been enrolled in the learning labs or academic intervention classes that were designed to improve their scores on the examinations. New York State mandates that students who score below the proficient range on the NYS English or Math exams must be enrolled in academic intervention classes for the corresponding test. The rationale for looking at these students was that there has been no study that shows that academic intervention classes actually promote improved achievement on subsequent NYS examinations.



Therefore, through a logistic regression, this study attempted to determine the how the odds of scoring in the proficient range on subsequent New York State math or English Language Arts examinations were affected by being enrolled in AIS classes. Students who were enrolled in the academic intervention classes uninterrupted for 2 years were considered for this study.

The data were collected through a request for confidential information from the school district. The school district has a process for requesting such information that includes writing a letter to the superintendent and stating the nature of the use of the information. The district provided the information without any identifiable factors. Once received, the data was cleaned up and any information not necessary for the study was removed. The data was then input into the SPSS software and analyzed using a logistic regression to determine the odds of the students scoring in the proficient range on the NYS English language arts or mathematics examination.

As far as sample size in concerned, the general rule of thumb is that there needs to be 20 cases per predictor, with a minimum of 60 total cases (Leech, Barrett, & Morgan, 2011). I sought a minimum of 20 subjects who were enrolled in the academic intervention classes and that took the subsequent NYS examinations.

### **Data Analysis Procedures**

After receiving anonymous student data from the school district, I entered the information into the SPSS database. Through a logistic regression, I determined the odds of a student who received increased exposure to material scoring in the proficient range on a subsequent NYS grade math or English exam. Peng, Lee, and Ingersoll (2002) stated that “Logistic regression is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical predictor variable”| The data concerning the seventh grade students were analyzed using their sixth grade NYS test scores as a

base line from which the impact of the academic intervention services on their eighth grade NYS exam scores was determined. The data regarding the eighth grade students were analyzed using their seventh grade NYS test scores as a baseline from which the impact of the academic intervention services on their seventh grade NYS exam score was determined.

### **Limitations**

The correlational design of this study was to determine if there is a relationship between attendance in the academic intervention classes and student achievement on subsequent examinations. In correlational studies, the researcher is determining the strength of the relationship that exists between two variables; one variable is not a predictor of the other. An experimental design is not appropriate because I am not manipulating any of the predictor variables. Additionally, a cause and effect design would not work due to the multitude of other variables that could not be accounted for.

This study has limited generalizability because of the population that is being addressed and the size of the sample used. The results cannot necessarily be generalized to the larger population. The following limitations pertain to the study and its data set, sample, and analysis. These limitations may disrupt the validity of the study.

- The requirements for subjects to be included in the study were very specific. The study did not include any students who were enrolled in the school for less than 2 years.
- The makeup of the groups of students was not necessarily balanced when it came to gender. The groups were designed using the selection criteria of attendance at BIS classes in either seventh or eighth grades.
- The study used student level data for seventh and eighth grade students in one middle school and can only be generalized to that population.

- Only general education students that were mandated to be scheduled in AIS classes were considered for the study.
- Students included in the study were enrolled in the AIS classes for the 2013-14 school year, but did not necessarily have the same teacher in the classes.
- Some students in the study had AIS instruction in elementary school and others did not.
- The study did not take into account any test preparation the students may have done for the assessment exams outside of the AIS classes.

### **Delimitations of the Study**

Delimitations are necessary because there are factors that might affect the external validity of the study.

Within the academic intervention classes the type of instruction that the students received was not accounted for. While these courses are required by New York to be offered, there is no set curriculum and the schools are left to teach them as they see best. While the teachers are encouraged to work on the skills necessary to pass the NYS eighth grade assessments, they are not micro-managed. Consequently, the way the material is presented in the classes varies from class to class and teacher to teacher. Some teachers are regimented and have detailed lessons every day in class and others are more lenient in the way the material is presented to the students.

In addition, this study took place during only 1 school year, in one school district, using only seventh and eighth grade students. In general, in order to make wide ranging claims about the use of academic intervention instruction classes more expanded research would need to be completed.

In addition to instruction, there was no way to account for how the state test was perceived by the students and their families. In this day and age, there is strong push back by students and

parents about the amount of testing that goes on in classes. This push back can result in students not taking the test as seriously as it should be taken. Even in the case where students are encouraged to do their best, if a student knows that the exam has little bearing on his or hers grades, it may open the door that it is not important; resulting in a lack of effort.

Chapter II takes a closer look at the literature associated with the study and the criteria used for inclusion and exclusion in the review. Chapter III discusses the methodology involved in the study. Included in this chapter is an overview, description of the sample, data collection procedures, data analysis procedures, and ethical considerations. Chapter IV presents the summary of findings. This chapter provides an overview of the statistical analysis and addresses the individual research questions. The final chapter, Chapter V, presents the conclusions drawn from the research, recommendations for school administrators, and recommendations for future research and practice.

### **Definition of Terms**

NYS English Language Arts grade 8 test scores are reported as scale scores from 100 to 417. Scores that are greater than or equal to 316 are considered proficient.

NYS Math grade 8 test scores are reported as scale scores from 119 to 403. Scores that are greater than or equal to 322 are considered proficient.

NYS English Language Arts grade 7 test scores are reported as scale scores from 103 to 413. Scores that are greater than or equal to 318 are considered proficient.

NYS Math grade 7 test scores are reported as scale scores from 133 to 401. Scores that are greater than or equal to 322 are considered proficient.

Academic Intervention Services/Basic Skills Instruction: These are classes that are intended to increase exposure of instructional materials to facilitate better performance on state examinations. Eligibility for free and reduced lunch: This refers to students who are participating in the federal free and reduced lunch program. This information is widely considered to be a good indicator of a student's economic level.

NCLB: The No Child Left Behind Act that was signed into law by President George Bush on January 8, 2002. This law is considered by some as the start of a reform movement that included sweeping changes to the Elementary and Secondary Education Act that was initially signed in 1965. NCLB shifted the focus to determining school success by its students' achievements.

## **Chapter II**

### **REVIEW OF LITERATURE**

The focus of this study hinges on the framework that there is a link between a student's attendance in academic intervention classes and his or her academic achievement on subsequent NYS examinations. The purpose of this review is to examine the literature that has studied the effect that increased exposure to instruction and learning material has had on academic achievement. The types of research that are included in this review are qualitative, quantitative, and mixed-method designs. There are literature reviews that already exist on the topic of time on task and increased exposure to material, and the findings of these reviews helped to provide direction for the purposes of this review. Reviews on the subject of interventions themselves have indicated both that they have an effect on achievement and do not have an effect on achievement. For the most part, the reviews supported the notion that scientifically- based interventions have had the most success in helping students achieve.

#### **Methods**

The methods for collecting the literature were to navigate the databases that are supported through the Seton Hall University library. The databases used were Proquest Multiple Databases, LexisNexis Academic, and ERIC. Proquest is an internet-based tool that utilizes hundreds of partnerships with various types of content creators (Proquest, 2014). The Proquest database is world renowned for providing access to research studies from higher learning institutions. LexisNexis Academic is a world-renowned company that is utilized in over 100 countries. It provides users access to hundreds of thousands academic documents and studies (LexisNexis, 2014). Throughout the process of searching for different studies and documents relating to the effect of academic intervention strategies on student achievement, I used the

advance search methods of all three databases. Within the advanced search method, specific terms were connected with queries in order to filter the studies. Terms such as *basic skills instruction and academic achievement*, *effect on state testing*, *increased instructional time and academic achievement*, *Academic Intervention Services and academic achievement*, and *student achievement* were all searched for both in the text of the document and the title of the document. The results were filtered both by date and relevance to the searched terms. Finally, the searches were limited to peer-reviewed studies and scholarly journals. Those studies and journal articles that were read and deemed appropriate were then selected for this review. Those studies and journal articles that were read and found not to address the specific purpose of this review were excluded. In addition to the studies, this review examined professional journals and reports that were related to the topic of academic intervention and state testing. I utilized the Boote and Belie literature review framework (2005) to organize the information.

### **Limitations of the Review**

For this review, some limitations existed. The first limitation was that the reviewed research only looked at the correlation of between students who received increased academic interventions and their achievement. There was no research found that examined the types of interventions received and how well students did on subsequent examinations. A second limitation was that only research that discussed how well the target population did on state exams was considered. I did not look at the quality of instruction that students received in their academic intervention classes or local achievement. Finally, the last limitation was that the research only looked at those students who were required to receive academic intervention services under state or federal guidelines.

### **Criteria for Inclusion and Exclusion of Literature**

For the purposes of this review, I considered peer-reviewed articles, dissertations, studies, and reports that analyzed the effect of increased instructional time on subsequent student achievement as measured by a standardized examination. In order for a study to be considered it had to be published within the last 10 years or since the inception of the No Child Left Behind legislation, except in cases in which the study was considered important to the development of the educational topic.

In addition to the above requirements for inclusion, there were also more specific requirements. Only studies that included a quantitative component were included. This eliminated studies that were solely qualitative. In addition, only studies that dealt with population in the K-12 environment were considered. Finally, only those that culminated with either a locally developed or state developed assessment as a bench mark were considered.

### **Methodological Issues with Existing Literature**

The research that has been conducted on the effect of increased instruction on academic achievement has had mixed results. There have been various types of research done including quantitative, qualitative, and mixed-methods designs. All of the different research designs have yielded different results. There is one constant that can be seen when looking at the research, and that is that there is some effect on academic achievement when discussing increased exposure to material. This section looks at the overlying methodological issue that is involved when looking at the effect of academic intervention services on student achievement. This overlying issue is, in fact, academic achievement. There is no consistent definition for *academic achievement*, and different parts of the country define achievement differently. Student achievement is defined by the state of Texas as “essential knowledge and skill covering one core



subject, including language arts, reading, writing, mathematics, social studies and science (Texas Education Agency, 2012). New York State defines academic achievement as the adequate yearly progress (AYP) a student makes in any one subject (NYSED, 2008). Neither definition is clear, nor is either definition left up to interpretation by the person reading them. In order for there to be consistency in the results of the studies there needs to clarity on what academic achievement is and what it is not. For the purposes of this study, academic achievement is defined as scoring at or above the proficient range on standardized test scores.

### **Examination of Current Literature**

During the review of the research it became apparent that the research dealing with the effect of increased exposure to material that is being assessed on subsequent examinations can be divided into the following areas: seminal works discussing the implementation of academic intervention services or basic skills classes, increased instructional time during the regular school day and increased instructional time given outside the regular school day. Many of the studies focused on attendance rates in the academic intervention classes.

#### **Seminal Works**

In the early 1980s the United States Department of Education published a report called *A Nation at Risk*. This report was aimed at correcting the perceived problems with the American educational system. This report is widely considered to be a catalyst that helped the recent reform movement in the United States. The report was developed by a panel of stakeholders who all played roles in the educational process. These stakeholders worked in various educational environments ranging from elementary school through college (NCEE, 1983). The report was intended to address the fact that the nation was failing to meet the need for a properly

trained workforce. . The report specifically addressed the quality of teaching and learning at the primary and secondary levels.

With regards to teaching, the report noted specific issues with the teaching as it was occurring in the country. First, the report indicated that there were not enough academically eligible students who were becoming teachers, and that teacher preparation programs needed to substantial improvement (NCEE, 1983). The report indicated that teacher preparedness was a major issue, and that higher learning institutions needed to adjust their course loads in order to effectively train teachers in strategies of effective teaching.

In addition to these seminal works changing the landscape of education in the country it is important, for the purposes of this review, to point out there has also been landmark legislation that has changed the face of education. In 2004, the federal government passed the No Child Left Behind (NCLB) Act that has had a great effect on the state of education in our country. NCLB, officially named the Elementary and Secondary Education Act, was the federal government's push for standards-based reform in our nation's schools. The federal government's intent with NCLB was to set higher standards for students to achieve and to create more measurable goals. The national law required that all states adjust their standards and set up assessments in order to be able to measure the progress that students are making in their studies. The act requires that each individual school district demonstrate Annual Yearly Progress (AYP) or risk being identified as a district in need by the federal government (NCLB, 2004).

The NCLB Act requires that states revisit the teaching practices that are being implemented in their schools and reform them to programs that are supported by scientifically-based data (NCLB, 2004). The act defined these programs as "programs that are supported with research that involves the application of rigorous, systematic, and objective procedures to obtain

reliable and valid knowledge relevant to education activities and programs" Scientifically-based research results in "replicable and applicable findings" from research that used appropriate methods to generate persuasive empirical conclusions. As a result of this legislation the more traditional ways of teaching that are not supported by scientific research are no longer viewed as appropriate teaching methods by the federal government.

It is the mixture of these seminal studies and legislation that has contributed to the educational climate that we are experiencing right now. Federal and state governments are supporting the use of scientifically-based teaching models and interventions to increase student achievement. The overall question that is created though is: Do these scientifically- based teaching strategies actually have an effect on student achievement when it comes to the standardized examinations that are being used to assess their understanding. In other words, districts are spending countless dollar amounts to give students increased exposure to materials and instructional time without sufficient data that the increased time actually has a positive effect. Furthermore, the exams themselves cannot possibly measure every aspect of the curriculum that is necessary to have a full understanding of a specific content area. For the purposes of this review I will look at numerous studies in which students were given scientifically-based interventions and the effect that those interventions had on student achievement as measured by imperfectly constructed and imperfectly interpreted state examinations. Nevertheless, given the present state of the art of scientifically-based instructional strategies, this is better than having no criteria for measurement at all.

### **Review of Research**

There are a number of empirical studies that focus on factors that affect student achievement. A significant number of these studies focused on prior performance as a predictor

of future achievement. After the implantation of NCLB in 2001 and its response to intervention requirements, the state of Georgia developed a four-tiered Response to Intervention system that is designed to provide different levels of intensity and support to students based on the needs that they present. The different layers of the program provide supports that are in line with the evidence-based requirements of RTI (Georgia Department of Education, 2012).

The four-tiered Georgia model starts out with tier 1, in which all students are taught. These students receive instruction based on the Georgia Performance Standards. The second tier is for students who are identified as in need of standard intervention. This standard intervention is viewed as supplemental to their regular instruction and is designed to help the students with their understanding of the material. The students in tier 2 are monitored and then determined eligible for either continued services (stay in tier 2), in need of more services (move to tier 3) or no longer need services (move back to tier 1).

Students who are moved in to tier 3 are found to be in need of more services. The services provided in tier 3 are more individualized for the students. The first part of tier 3 is to determine the strengths and weaknesses of the student and design services that cater to those strengths. Tier 4 students are those students who have been determined to be in need of a special placement. The students placed in tier 4 are then given specialized instruction based on their needs (Georgia Department of Education, 2012).

In 2011, a study was conducted to determine the effective of the Georgia model on the student achievement. Adams (2011) studied a sample that required the intervention of remedial math instruction. This quantitative study looked at at-risk students who received remedial math instruction and compared them to at-risk students who did not receive remedial math instruction. For the purpose of comparison I used the Georgia Criterion Referenced Competency Test scores

of each groups of students. The student's previous years scores were also used as a control variable. The sample of the study consisted of 293 students. There were 181 students in the control group and 112 students in the treatment group. Adams (2011) stated that the purpose of the study was to identify whether or not remedial math education as an intervention had an effect on student achievement as related to the Georgia Criterion Referenced Competency Test.

Adams (2011) looked at seventh grade students who had been identified by the state as at-risk. The research question was: Do at-risk seventh-grade students who receive remedial math instruction have statistically significant different mean scores on the 2010 Georgia mathematics CRCT when compared to at-risk students who do not receive remedial math instruction? Adams concluded that those students who did receive remedial math instruction as part of the Georgia Response to intervention system did in fact attain a statistically significant higher score on the Georgia mathematics CRCT when compared to those students who did not receive the remedial math instruction.

A one way analysis of covariance was used to determine the mean difference in math achievement scores between those who did receive the remedial math course and those who did not. Adams (2011) stated that ANCOVA is particularly useful when participants cannot be randomly assigned to groups, but when the researcher still needs to compare both groups. The effect size was interpreted using Cohen's conventions. The interpretation was based on thresholds of .01 for a small effect, .06 for a moderate effect, and .14 for a large effect (Adams 2011). The results of the study indicated that there was a significant relationship between at-risk students who take remedial math classes and their scores on the Georgia Criterion Referenced Competency Test as compared to at-risk students who did not receive the remedial math classes.

One limitation of this study was that the sample size is small. Of the 293 students that participated in the study only 112 participated in the remedial math instruction. Although those 112 students did in fact score higher on the Georgia mathematics CRCT, the results may not translate to the larger population of students within the Georgia School System. Additionally, the content of the remedial math classes was not addressed, and in order to duplicate the results the same content would have to be covered. The strength of this study was that it was a quantitative design that allowed for a statistical comparison between the groups of students. Additionally, through the use of the Georgia Criterion Referenced Competency Test, Adams had a proven test with known reliability. The information was then analyzed using SPSS software.

### **Effect of Standardized Testing on Instruction**

In New York State, every grade between first and eighth culminates the school year with a standardized test. In this type of atmosphere it is very likely that the tests drive teachers' instructions. When tests drive instruction, teachers tend to put the demands of the tests above the needs of their students. In the end, schools will have instruction that is patterned to mimic high stakes tests, rather than molded to fit individual student needs.

The term, *bubble kids* (Bracy, 2005), was used to describe a small group of students who teetered on the end of the proficiency line on state examinations. These students, with just a little help, would rise above the line and improve the image of schools, school districts, and teacher performance ratings. With the goal to get as many students to score in the proficiency range as possible, teachers may ignore the students who are the highest and lowest in their classes. The assumption that high achieving students will continue to achieve highly and low achieving students may be a lost cause, teachers focus on the bubble kids as a means of improving the bottom like i.e. increasing achievement. As a result of the increased achievement,

schools and districts may achieve annual yearly progress (AYP) and avoid the consequences imposed by the state and federal governments.

### **Test Error**

Test error is an unavoidable issue when dealing with standardized tests to measure student achievement. Test error can happen in several ways; from miscalculation of grades to having multiple correct responses for questions that are asked. In New York City in 1999, Goodnough, (2002) points out that the testing company, McGraw Hill, incorrectly scored reading and math examinations for more than 8500 students. It was found that thousands of students were mistakenly sent to summer school, and the school system was led to believe that test scores had dropped.

In 2003, the state of Massachusetts found that that there were multiple correct answers to a question on the high school exit exam (New York Times, 2003). After analyzing the problem, students' scores were adjusted and almost a thousand more students were able to graduate in state wide that year. Similar issues can be found in states across the union.

Kathleen Rhoades (2003), who is a co-author of *Errors in Standardized Tests: A Systemic Problem*, a study by the National Board on Educational Testing and Public Policy at Boston College, found that more than 100 errors were made, beginning in 1999, on various standardized tests throughout the United States and in the United Kingdom. Rhoades felt that the testing industry was shrouded in secrecy, and that the industry should have received some sort of federal or state regulation. The researchers divide test error into active (specific) and latent (poor legislation or management). They also confirmed that with the increase in standardized testing errors in testing also increased. Many educators are advocating industry regulation by the government or, at the very least, compiling a national data base to track testing errors.

In addition to actual test errors, test biases are an issue. Anthropologists in the early 1900s, like Franz Boas, criticized the biased nature of intelligence tests, and he challenged the uses of standardized test results by educational, immigration, and law enforcement officials (Wax, 2000). Assigning significant meaning to tests that measured cultural participation more so than innate intelligence has always been a criticism of testing. Other criticisms forwarded by social scientists include the potential biases in interpreting the results of standardized testing.

While all tests have biases, standardized tests are biased in particular ways. Standardized tests lean towards specific views and knowledge sets in both intended and unintended ways, and by their very nature they exclude a diversity of interpretations in support of one social group over others. (Nairn, 1980). One illustration can be found in the case of scoring written essays. Some tests specify the proper form of writing a paragraph in which all paragraphs must have a topic sentence, at least two supporting sentences, and a concluding summary sentence. An understanding of what is a proper paragraph simplifies the measurement of writing, as low paid and overworked test graders are faced with grading mounds of standardized exams. Under such rubrics, however, some ordinary writers could receive high grades and some extremely gifted writers could receive failing scores. Standardized tests can, therefore, discriminate against those who think in non-normative ways for whatever reason (Price, 2003).

### **Gender Differences and Achievement**

There is little research supporting the notion that there is a gender gap regarding the impact of academic interventions on student achievement. Gonzales (2008) pointed out that the overall achievement of boys and girls increased steadily from 1999 to 2007. Gonzales et al. (2008) stated that the achievement of the American students of both genders outweighed that of equivalent international students. In earlier grades, Gonzales pointed out, female achievement



slightly outweighed male achievement, but by the time the students reached the eighth grade there was no measurable difference in their performance (Gonzales et al., 2008).

In a report generated for the American Association University of Women, Corbett, Hill, and Rose (2008) concluded that male achievement slightly outweighed females when National Assessment of Educational Progress (NAEP) scores were analyzed. Corbett et al. cautioned readers not to read too much into the results of their study; that there were other factors to be considered when looking at achievement, including socioeconomic status and ethnicity. In contrast to the Corbett et al. study, Scafild and Bui (2010) conducted a study of ten thousand eighth graders and performed a multivariate analysis of three standardized test scores from three grade levels (8th, 10th and 12th) and found that gender did not affect overall test scores. Digging deeper, Scafild and Bui determined that performances on the tests was not altered by sex, race, SES or math ability.

Despite the research that supports that there is not a difference in achievement between genders, there is still a misconception that boys are better at math and girls are better at English. Could this misconception lead to students having a pre-determined assumption about their strengths and weaknesses and basing scheduling or career decisions on those misconceptions. It is possible.

### **Intervention Services in New York State**

Early in the 2000 school year the New York State Education Department required all school districts to begin offering Academic Intervention Services to students who were underperforming (NYSED, 2000). This initial mandate replaced remedial instruction with the offer that struggling students be provided additional opportunities to learn the material and skills appropriate for their grade level. Initially, the guidelines did not offer strategies to help students

to be successful, but rather encouraged school districts to utilize new, innovative, instructional strategies to satisfy their struggling students' needs. As a result of the new policy changes, many districts across the state increased staff to accommodate the need to offer the extra services (Monk, 2001). The New York State Education department divided AIS services into two parts; first, instructional strategies and second, support services. The instructional strategies are intended to supplement the regular curriculum that the school is already providing. The support services are services that districts provide to help student manage any challenges they face that may impede their learning (Deeb-Westervelt, 2002)

Student eligibility for academic intervention services is based upon the following criteria, as defined by the New York State Education website.

- Students who score below designated performance levels on state assessments in English, Mathematics, Science and Social Studies.
- Students at risk on not meeting state standards as indicated by district procedures.
- Limited English Proficient (LEP)/English Language Learners who do not achieve the designated performance standards. AIS must be provided in addition to ELL/LEP services.

All districts in New York State are required to have a well-developed AIS plan that offers services throughout the district at all levels. The plans must be approved by local boards of education and are required to be reevaluated every 2 years. The plans are required to include three essential elements: (a) procedures for determining the needs for AIS; (b) the interventions that will be provided, including how often and when the services will be provided; and (c) the criteria for terminating services.

Different districts implement their academic intervention services in different ways. First, they must identify how many students will be scheduled into the AIS classes. In 2000, there was a mandate to offer the classes, but the identification the students was left up to the local district, with the identification of the students to be made using their own criteria. In a survey of building administrators taken in 2003, Kileen and Sipple, (2005) asked how the students were identified as being in need of AIS services. Overwhelmingly, the building administrators relied on standardized test scores, report cards, and guidance counselor recommendations to both enroll and dismiss students from AIS classes. The Killeen and Sipple survey (2005) indicated that 70% of all school districts in New York State relied heavily on the standardized examinations to make enrollment decisions. In 2013, the New York State Education Department mandated that anyone who received below the proficiency level on the New York State examinations be enrolled in an AIS class.

The New York State Education Department recommended the following conditions when developing an AIS plan:

**Staffing:** Districts should use qualified and appropriately certified staff to provide services. Teaching assistants or aids cannot provide primary services to students in need of AIS.

**Scheduling:** Options for providing services may include, but are not limited to the following: before/after school, extra staff with-in a classroom, summer school, or extended school days.

**Progress:** Districts should monitor the progress of the students receiving services. The progress monitoring must be documented and recorded. Parents should be given quarterly progress reports of their child's progress.

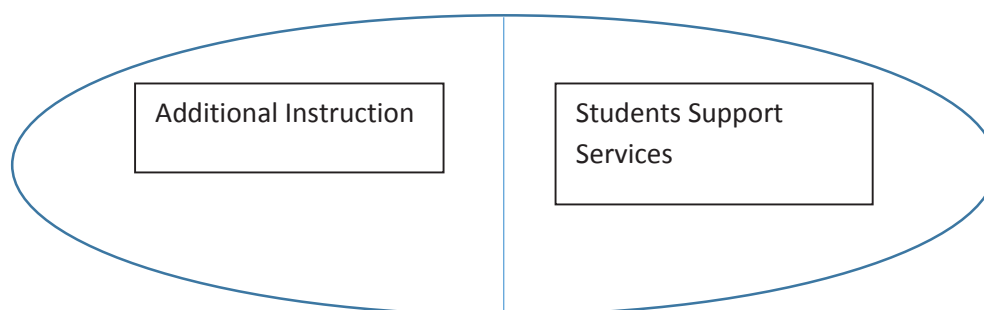
Parent Communication: Parents and guardians must be notified of the following occurrences: commencement of services, discontinuation of services and progress. In addition, parents are permitted to object to the services, however it remains the responsibility of the school to identify and provide services to students in need. Finally, parents may advocate for services to be provided and district should make an independent evaluation for the students.

In a 2001 study (Monk et al, 2001), building administrators expressed frustration with the identification process. The frustration concerned the fact that many of the scheduling decisions were based upon outdated test scores. In 2001, NYS did not have math and English language arts tests in every grade, so at times building administrators were making decisions about students' schedules using standardized test scores that were not up to date. In short, the building administrators felt that they needed to have a more timely diagnostic procedure. The number of exams in NYS state increased in 2005, and all students between third and eighth grade took an English Language Arts and Math Examination. On the surface, with students taking yearly ELA and math assessments, the districts had a timely diagnostic tool to help identify the underperforming students. For a time, the identification criteria was still left to local districts to develop for AIS services; until the state mandated the services for anyone who scored below the proficiency range on the 2013 3-8 NYS English Language Arts or Math examinations.

There are essentially four ways for districts to offer academic intervention services: (a) academic intervention services being offered within the regular classroom; (b) academic intervention services being offered during class time, outside of the of the regular classroom; (c) academic intervention services being held in addition to the regular classroom, in lieu of electives; and (d) academic services held in place of the regular classroom. Figure 2 shows the

two components of academic intervention services. Each of the different components is looked at more closely. .

*Figure 2.* - The two components of AIS services.



### **Academic Intervention Services Being Offered Within the Regular Classroom**

Through this model, sometimes referred to as inclusive, the academic intervention services that the students receive are through additional exposure to materials within the classes for which they are already scheduled. This model primarily uses the regular education teacher to perform the AIS services, in lieu of a special education teacher. This model, according to Kileen and Sipple (2004), is used the least frequently in the New York State schools that they surveyed.

Some schools may offer interdisciplinary classes. These classes are typically taught in a self-contained classroom that provides students with the academic work necessary for success (Intervention Central, 2014). Students who need academic help, organizational help, or study skills can benefit from this program. It does not include a behavior modification program, but it does include an AIS class in math and English Language Arts (ELA) in the daily schedule. The class size is often limited, and when students are ready they can be scheduled into mainstream classrooms.

### **Academic Intervention Services Being Offered During Class Time, Outside of the of the Regular Classroom**

The second strategy for Academic Intervention Services is offering the services to students during the regular class periods, but outside the classroom. The main difference between the first two strategies is that the students receiving the services in this model are pulled-out of the regular classroom to get more individualized or small-group instruction for their skills. This model is viewed by many as a supplemental program, as the students do miss instructional time in the regular classroom. Many administrators feel these types of programs are the least detrimental to academic learning when the students are pulled from their regular English classes because the content of the two classes is so closely aligned (Kileen & Sipple, 2005). Roughly 30% of students receiving AIS services in districts outside of the five large urban districts in New York State are receiving this type of service (need to cite the source of this data here).

### **Academic Intervention Services Held in Addition to the Regular Classroom, in Lieu of Electives**

This third strategy is a different approach and students are scheduled into an academic intervention service class as a regular class period. These classes, commonly called *instructional labs* and created specifically to meet the needs of underperforming students, meet in addition to students' regular English or math classes. These classes replace electives in these students' schedules and tend to focus on skill development (Killeen & Sipple, 2005). In order for this model to be successful, local schools and districts need to allow certain electives, such as art or technology, to be replaced by the AIS classes. A drawback of this model is that students miss out on electives that would otherwise be of interest to them, and sometimes students may be

scheduled for two AIS classes, one for math and one for English, essentially filling up their schedule with classes that are all academic in nature.

A laboratory classroom program is typically developed when there is a need for students to receive individualized instruction in their weak areas. Laboratory programs typically offer math lab classes and ELA lab classes. The lab curriculum instruction closely ties skills instruction to classroom curriculum so that students can more clearly see the connection (Intervention Central, 2014).

### **Academic Intervention Services Held in Place of the Regular Classroom**

The last strategy for offering academic services is to replace the regular academic classes with AIS classes. This model is sometimes referred to as *self-contained*. These types of classes tend to be reserved for the most extreme cases and they represent the smallest amount (13%) of AIS classes across New York State (Killeen & Sipple, 2005).

Often schools may offer an alternative learning program. It is a smaller class of students who are focused on hands-on learning activities (Intervention Central, 2014). The alternative learning program idea is based on the belief that there are many ways to become educated and many environments in which learning can take place. After analyzing New York State English-language arts and math assessment scores, school administrators find that many students are in need of more instruction in basic skills. The alternative learning programs offer AIS math and ELA components that are built in to the program. Students have separate ELA and math AIS classes that are taught by the math and ELA laboratory classroom teachers who work closely with the alternative learning staff to develop those skills.

**Academic Intervention Services Held as an Extension of the School Day.**

Some schools offer academic intervention classes after the regular school day has ended or before it starts. These scheduling of these classes gives students opportunities to develop the necessary skills and to continue to participate in the regular elective programs at their schools. These types of classes may sometimes resemble the aforementioned laboratory classrooms. The curriculum typically offered addresses skill development and times the necessary skills to the topics being covered in the student's regular education classes.



### **Chapter III**

## **RESEARCH DESIGN AND METHODOLOGY**

A concern facing educators and researchers is to estimate the degree of impact. This study sought to determine the impact of increased instructional time on subsequent state examinations. The stepwise logistical regression developed a model for prediction and allowed for an odds ratio that was used to identify how many more times a student is likely to score in the proficient range if they are given an additional opportunity to learn the material that is on the subsequent examination. Chapter III presents the details of the research design, the research questions, the methodology, the sample, the data collection methods, the statistical analysis procedures, and the data reporting formats for the study.

### **Methodology**

I used a non-experimental, correlational, explanatory, cross-sectional design with quantitative methods. Logistic regression was the primary analysis technique. “Logistic regression is useful when you want to predict a categorical variable from a set of predictor variables” (Leech, Barrett, & Morgan, 2011) In the case of this non-experimental explanatory study, I sought to predict the odds of a student scoring in the proficient range on a subsequent NYS standardized exam.

### **Purpose of the Study**

My purpose for this correlational, quantitative study was to determine the efficacy of the academic intervention classes that were offered within a school district. More specifically, I sought to determine whether the mere attendance at these additional instructional sessions, irrespective of who taught them, improved the odds of those students achieving the proficient level on state mandated tests in grades 7 and 8. Although all schools in the state offer these

classes, there is no set curriculum for the content that is supposed to be taught. Within the middle school studied the AIS classes were not taught by the same person. Different teachers with different skill sets from each department were responsible for the classes. Additionally the classes were not part of the regular teaching load, therefore the teachers were not observed teaching the AIS classes. By focusing on seventh and eighth grade students from the same large middle school, who were assigned to the AIS classes starting at the beginning of the school year based on their previous years exam score and remained in the AIS class for the full school year culminating with their current years NYS exam. Academic intervention services have been offered in middle schools throughout the state for many years, but after the results of the 2013 NYS English Language Arts and Math examinations the state mandated that any student who scored below the proficient range be scheduled into these classes. As a result, schools now have more students who are taking these classes and missing out on opportunities to take other classes that might interest them.

The results of empirical research have suggested that increased instructional time may have some impact on academic achievement (Smith, 2005). In 2005, the federal government commissioned a national evaluation of the twenty-first century community learning centers (U.S. Department of Education, 2005). Among other findings, the evaluation determined that the centers, which were designed to increase students' exposure to material, had little effect on academic student outcomes. Districts in New York and other states are designing courses that increase the amount of time that students are exposed to material with the hope that student scores on state examinations improve. This study looks to add to the research that has already been done in this area.

### **Research Questions**

The research questions will investigate the predictive value of attendance on the achievement scores of middle school students taking the NYS English or Mathematics examinations. The null hypothesis was that attendance does not have an impact on the prediction of the scores of seventh or eighth grade English language arts and mathematics achievement scores.

The overarching research question was as follows: What is the efficacy of the academic intervention classes in terms of increasing the odds of scoring in the proficient range on a state examination, as measured by New York State seventh and eighth grade English Language Arts and Math examinations?

Research question 1: How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 8 English Language Arts examination for the 2013-14 school year?

Research question 2: How well does enrollment in a math academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 8 Math examination for the 2013-14 school year?

Research question 3: How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 English Language Arts examination for the 2013-14 school year?

Research question 4: How well does enrollment in a math academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 Math examination for the 2013-14 school year?

### **Null Hypotheses**

Null hypotheses 1: Enrollment in an English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 English Language Arts examination for the 2013-14 school year?

Null hypotheses 2: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 Math examination for the 2013-14 school year?

Null hypotheses 3: Enrollment in an English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 English Language Arts examination for the 2013-14 school year?

Null hypotheses 4: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 Math examination for the 2013-14 school year?

### **Sample and Data Collection**

All information explored in this study was from a large middle school in New York State. The administrative team has one campus principal and three wing principals. The wings themselves are made up of traditional classrooms; students are intermingled when it comes to periods such as lunch, Technology, Home and Careers, and Physical Education. For the most part, students take the majority of their academic subjects in their home wing with the exception of special education students and a few regular education students who have unique scheduling conflicts.

This study included the results from eighth students who had taken both the seventh grade and eighth grade state examinations, as well as been enrolled in the learning labs for the entire school that were designed to improve students' scores on the examinations. New York State mandates that students who score below the proficient range on the NYS English or math exams must be enrolled in academic intervention classes for the corresponding test. The rationale for looking at these students was that there was no set curriculum for these classes, therefore, through a logistic regression, the study attempted to determine if the odds of scoring in the proficient range were affected by enrollment in the AIS classes.

### **Data Collection Procedures**

I looked to determine whether students, when given an additional opportunity to learn (through AIS classes or learning labs) the materials that are assessed on the state exams, increased their odds of scoring in the proficient range. I analyzed both seventh and eighth grade results. When researching the eighth grade results I used the seventh grade scores as the baseline assessment. The eighth grade results were placed in the academic intervention classes based on their achievement score on the previous year's NYS seventh grade assessment. The students who were subsequently enrolled in the AIS classes scored below the proficient range on the NYS seventh grade examination. Those eighth grade students that scored below the proficient range on the NYS seventh grade English examination were placed in an English AIS class for their eighth-grade school year. Those eighth grade students who scored below the proficient range on the NYS seventh grade math examination were placed in a math AIS class for their eighth-grade school year. There were a few eighth grade students who scored below the proficient range on both (English and Math) NYS seventh grade examinations that were subsequently placed in two AIS classes, one for math and one for English.

The seventh grade results being studied were placed in the academic intervention classes based on their achievement score on the NYS sixth grade assessment of the previous year. The students who were subsequently enrolled in the AIS classes scored below the proficient range on the NYS sixth grade examination. Those seventh grade students that scored below the proficient range on the NYS sixth grade English examination were placed in an English AIS class for their seventh-grade school year. Those seventh grade students who scored below the proficient range on the NYS sixth grade math examination were placed in a math AIS class for their seventh-grade school year. There were a few seventh grade students who scored below the proficient range on both NYS sixth grade examinations that were subsequently placed in two AIS classes, one for math and one for English.

The data was collected from a large middle school in New York State. The requirements for inclusion in the study were that the students be enrolled in the school for at least 2 years, and that they had taken either both the sixth and seventh grade exams or the seventh and eighth grade exams, depending on their grade. The seventh grade students being studied were enrolled in the AIS class for their entire seventh grade school year. The eighth grade students studied were enrolled in the AIS classes for their entire eighth grade school year. I then looked at the previous achievement of all the students that were included. In this case, previous achievement is equated with whether a student scored in the proficient range on the sixth grade exam for seventh graders being studied, or achievement on the seventh grade exams for eighth graders being studied. Then, I broke the students down into two groups, those that were in academic intervention instruction classes and those that were not, to determine if the academic intervention instruction was working.

Theoretically, AIS classes should have increased a student's chance of scoring in the proficient range on the state exams (NYSED, 2008). By determining if the students had increased odds of scoring in the proficient range on exams after taking the AIS classes, I was able to evaluate how well the school's academic intervention program was in achieving the program goals. Once the data was run through SPSS using a logistic regression, I evaluated how well the program was operating. If the odds of a student scoring in the proficient range were essentially the same for students enrolled in AIS classes and those who were not, the program was deemed to be functioning appropriately. However, if the odds of scoring in the proficient range of a student enrolled in a AIS class were less than those of someone not enrolled in the class, it may indicate that there is a problem with the academic intervention program.

I analyzed eighth grade students who were enrolled in the academic intervention class for their entire eighth-grade school year. Using the seventh grade NYS exam raw score as a baseline and running a logistic regression I was able to determine whether there was a statistically significant relationship between attendance in the eighth grade AIS classes and a student's odds of scoring in the proficient range on the subsequent eighth grade NYS examinations. The same held true when studying the seventh grade students who were enrolled in the AIS classes for their entire seventh-grade school year. I used the sixth grade NYS exam raw score as a baseline and ran a logistic regression to determine whether there was a statistically significant relationship between attendance in the seventh grade AIS classes and a student's odds of scoring in the proficient range on the subsequent seventh grade NYS examinations. Prior achievement was controlled for in this study by using the seventh grade raw scores for eighth graders and sixth grade raw scores for seventh graders on the NYS English and math examinations. The use

of the raw scores allowed me to determine whether academic intervention instruction students scored in similar ranges to non-academic intervention instruction students.

The data were collected through a request for confidential information from the school district. The process for requesting such information that included writing a letter to the superintendent and stating the nature of the use of the information. The district provided the information without any identifiable factors. Once received, the data was cleaned up and any information not necessary for the study was removed. The data was then input into the SPSS software and analyzed using a logistic regression to determine the odds of the students scoring in the proficient range on the NYS English language arts or mathematics examinations.

### **Data Analysis Procedures**

“Logistic regression is useful when you want to predict a categorical variable from a set of predictor variables” (Leech, Barrett, & Morgan, 2011). In the case of this non-experimental explanatory study, I tried to predict the odds of whether or not a student scored in the proficient range on a NYS standardized tests using binary logistic regression. The predictor variable was attendance in academic intervention classes, while the dependent or outcome variable was the score on the subsequent assessment exam. In order for a binary logistic regression to work appropriately, the dependent or outcome variable needs to be dichotomous and exclusive, or having one of two results. In this case, the dichotomy was that students either scored in the proficient range or the not-proficient range on the state exams. The goal of using the logistic regression was to determine if there was a relationship between attendance at additional instructional sessions and proficiency. The study did not attempt to predict scale scores on the NYS seventh or eighth grade math or ELA tests, but predicted if the students’ subsequent raw score fell in the proficient range.



Binary logistic regression requires outcomes to be dichotomous and have a value between 0 (will not achieve in the proficiency range) and 1 (will achieve in the proficiency range). Through the use of logistic regression, I ensured that all outcomes will land between these values. By analyzing the relationship between the independent/predictor variable (subsequent participation in additional instructional time) and the dependent/outcome variable (raw score), logistic regression calculated the odds of a student scoring in the proficient range on the subsequent NYS eighth grade exam. This process of maximal likelihood estimated the probability that attendance in the additional classes influenced achievement scores on the subsequent assessment.

In order to determine if there was a relationship between students being present in an academic intervention classes and the students' abilities to increase the odds that they score in the proficient range on a subsequent NYS seventh or eighth grade math or ELA examinations, I used binary logistic regression. To control for prior achievement I used the previous year's sixth or seventh grade exams proficiency ratings. After controlling for previous achievement, I compared the students using their seventh or eighth grade scores, depending on which grade they were in. The results were dichotomous, either proficient or not proficient.

After receiving the data from the school district, the different variables were coded and the information was put input into the SPSS software. The eighth grade students' NYS grade 7 ELA examination scores for 2012 and their NYS grade 8 examinations scores for 2013 were entered into the analysis. Additionally, the eighth grade math students' NYS grade 7 Mathematics Examination scores for 2012 and their NYS grade 8 Mathematics Examination scores for 2013 were entered for analysis. The seventh grade students' NYS grade 6 ELA examination scores for 2012 and their NYS grade 7 examinations scores for 2013 were entered

into the analysis. Additionally, the seventh grade math students' NYS grade 6 Mathematics Examination score for 2012 and their NYS grade 7 Mathematics Examination score for 2013 were entered for analysis. Finally, the academic intervention class enrollment data for all of the students was entered into the analysis. Students that were enrolled were entered as a 1 and those who were not enrolled in the AIS classes were coded as a 0. Once the gathered scores and the demographic information was entered into SPSS, a stepwise logistic regression procedure was performed to predict the outcomes for students enrolled in the academic intervention instruction classes. I determined the odds of someone scoring in the proficient range on the seventh or eighth grade NYS English or mathematics examination. The information gained through the use of the logistic regression was used to make sound educational decisions based on the data. If it was determined that the students' results mixed and are not consistent when comparing either English Language Arts scores and mathematics scores or when comparing seventh grade and eighth grade academic intervention classes. There is a need for further research to determine why there is a discrepancy between the two types of intervention classes and their ability to predict whether or not a student will score in the proficient range on the corresponding NYS examination.

I ran descriptive statistics on all the variables to determine means, ranges, and standard deviations. Then, I conducted a stepwise regression to determine best fit and check for multicollinearity of independent variables. Finally, I conducted the logistic regressions for mathematics and then for language arts.

### **Ethical Considerations**

The study used student data that was the property of the school district. The NYS English language arts and math test scores are made available to teachers, parents, and

administrators through the student management system. Parents and school officials are each given a unique login name that allows them to view the scores of the students that they are associated with.

Permission to access and analyze the data was granted by the Superintendent of Schools. In addition, the Superintendent granted permission to access preexisting student demographic and scheduling data (gender, race, socioeconomic status, class enrollment) so that there could be further analysis of the information. The district did not share any information that revealed the identity of any students. Each student was given a unique identification number that was generated by school district and was not related to his or her district generated student identification number.

## **Chapter IV**

### **ANALYSIS OF THE DATA**

#### **Introduction to Analysis**

My purpose for this correlational, quantitative, explanatory study was to determine the efficacy of the academic intervention classes that were being offered within a school district as measured by the New York State seventh and eighth grade English language arts and math examinations. More specifically, I sought to determine whether the mere attendance at these additional instructional sessions, irrespective of who taught them, improved the odds of those students achieving the proficient level on state mandated tests in grades 7 and 8. By focusing on seventh and eighth grade students from the same large middle school who were assigned to the AIS classes starting at the beginning of the school year based on their previous year's exam score and remained in the AIS class for the full school year culminating with their current years NYS exam, I examined the impact of enrollment in the AIS classes on the odds of students scoring in the proficient range on the subsequent New York State assessment.

This chapter presents the results of the analyses of the logistic regression models, including the statistical testing of the four null hypotheses introduced in Chapter III. This chapter is divided into four sections. The first section presents the descriptive statistics for the criterion and predictor variables and examines the analyses of the initial logistic regression model with respect to the frequencies of the categorical variables. The second section presents the results of the statistical testing of the logistic regression coefficients, which were used to test the four null hypotheses. The third section presents the analysis of model fit of the final logistic regression model. The fourth section contains a summary of the results of the analysis presented in this chapter.

### **Descriptive Statistics**

The criterion variable used in the logistic regression models, which is a nominal or qualitative variable, indicates whether each student did or did not score in the proficient range on a subsequent New York State mathematics or English language arts exam. The values of 0 and 1 were used to indicate whether a given student did or did not pass the test, respectively. It should be noted that a student's score had to equal or exceed the minimum level of proficiency for each grade level as defined by The New York State Education Department.

The mean value for the criterion variable indicates the proportion of students who passed a New York State English language art or mathematics test. The mean value on the 2012 English Language Arts examination for eighth graders was .22 or 22%. In other-words, 22% of eighth graders in the sample scored in the proficient range on their seventh grade English language arts test. The mean value for those same students on the subsequent 2013 eighth grade English language arts examination was .43 or 43%. The sample mean value on the mathematics examination for current eighth graders was .08 or 8% on the 2012 seventh grade mathematics test. The mean value for those same students on the subsequent 2013 eighth grade mathematics test was .72 or 72%.

The mean value 2011 English language arts examination for current seventh graders was .56 or 56%. In other words, 56% of seventh graders scored in the proficient range on their 2012 sixth grade English language arts test. The mean value for those same students on the subsequent 2013 seventh grade English language arts test was .23 or 23%. The mathematics mean value for the current seventh graders was .67 or 67% on the 2012 sixth grade mathematics test and .11 or 11% on the subsequent 2013 seventh grade mathematics test.

Tables 1 and 2 show the ranges of scale scores as well as the minimum score a student needed to score in the proficient range on the examination. The tables are inclusive of grades 3 thru 8 on the 2013 NYS English and math examinations. The scale score is determined by the number of points that the student has earned on the test. The number of points has to be on a scale so that the results mean the same thing year after year, even though different students are taking the examinations. The higher the number of points a student earns the higher the scale score will be.

Table 1

*2013 Mathematics Range and Proficiency Level of Scale Scores Across Grades*

Grade						
	3	4	5	6	7	8
Range of Scale Scores	139-394	126-402	126-406	119-399	133-401	119-403
Scale Scores Greater than or Equal to this Value are Proficient	314	314	319	318	322	322

**Source:** <https://www.engageny.org/resource/parent-resources-grades-3-8-ela-mathematics-tests>

Table 2

*2013 English Language Arts Range and Proficiency Level of Scale Scores Across Grades*

Grade						
	3	4	5	6	7	8
Range of Scale Scores	148-423	139-412	116-425	112-412	103-413	100-417
Scale Scores Greater than or Equal to this Value are Proficient	320	320	320	320	318	316

Source: <https://www.engageny.org/resource/parent-resources-grades-3-8-ela-mathematics-tests>

### Variables

Predictor variables in this study were: proficiency level on previous year's examination (coded 1 for proficient or 0 for not proficient), SES (coded 1 for eligible and 0 for not eligible), and Special Education Status (coded 1 for special education and 0 for not special education). The outcome/dependent variable data was derived from the 2013 New York State English and math examinations in either seventh or eighth grade, depending upon the population of students being examined.

### Overview of the Statistical Analysis

IBM SPSS version 22 statistical software was used to complete the statistical analysis for each participant group in the study. The first analysis performed was referred to as *block 0* and it does not contain any predictors. The second analysis performed by SPSS is referred to as *block 1* and included predictors for the study (Leech, Barrett, & Morgan, 2011).

1. Descriptive statistics were run to observe “frequencies” for categorical variables.
2. A binary logistic regression procedure was used to analyze the data. Binary logistic regression is helpful when you are trying to predict a categorical variable from a set of predictor variables. As stated in previous chapters the predictor and outcome variables are dichotomous when using the binary logistic model. (Leech, Barrett, & Morgan, 2011).

In logistic regression, the predicted dependent variable is a function of the probability that a subject being studied will be in one of the dichotomous outcome variable’s categories (0 or 1) (Weaver, & Wuensch, 2013). With regard to this study, logistic regression was used to explain the probability that an eighth grade student would score in the proficient range on the eighth grade NYS English Language Arts exam after being enrolled in a basic skills class.

The outcome variable in this study was scoring in the proficient range on a standardized New York State examination in either math or English language arts. The outcome variable was also coded dichotomously (0, 1) to represent either proficient or not proficient the predictor variables were categorical and are as follows: proficient/not proficient on previous years examination (1, 0), low socioeconomic status/not low socioeconomic status (1, 0), and special education or general education (1, 0).

Studies have shown that it is possible to make predictions of the odds of student achievement (need to cite the publications that you are referring to here). There is little current literature on predicting the odds of student achievement on the New York State middle school examinations. The lack of literature on this topic provided justification for this study.



## Eighth Grade English

Research question 1: How well does enrollment in a 2012-2013 English academic intervention class predict the odds of its participating students scoring in the proficient range as measured by the New York State grade 8 English language arts examination for the 2012-2013 school year?

Null hypotheses: Enrollment in a 2012-2013 English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 English language arts examination for the 2012-2013 school year?

### Frequency Statistics

Among the categorical predictor variables for the eighth grade English language arts students, 77.3% of the population was not proficient on the seventh grade exam, and this dropped to 57.1% on the eighth grade English language arts examination. Conversely, the same group saw a rise in its proficiency level from 22.7% in seventh grade to 42.9% in eighth grade (see Table 3).

Table 3

#### *Frequency Statistics for Categorical Predictor Variables Eighth Grade Students*

		Frequency	Percent	Valid Percent	Cumulative Percent
Language Arts 7 <sup>th</sup> grade	Not Prof	153	77.3	77.3	77.3
	Proficient	45	22.7	22.7	100.0
	Total	198	100.0	100.0	
		Frequency	Percent	Valid Percent	Cumulative Percent
Language Arts 8 <sup>th</sup> grade	Not Prof	113	57.1	57.1	57.3
	Proficient	85	42.9	42.9	100.0
	Total	198	100.0	100.0	

Figures 3 and 4 show the rise in the proficiency level for students from the seventh grade to the eighth grade in English language arts.

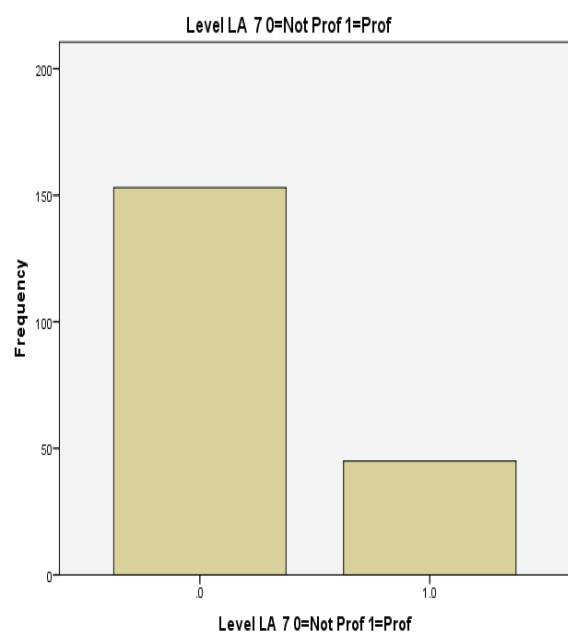


Figure 3: Change in proficiency.

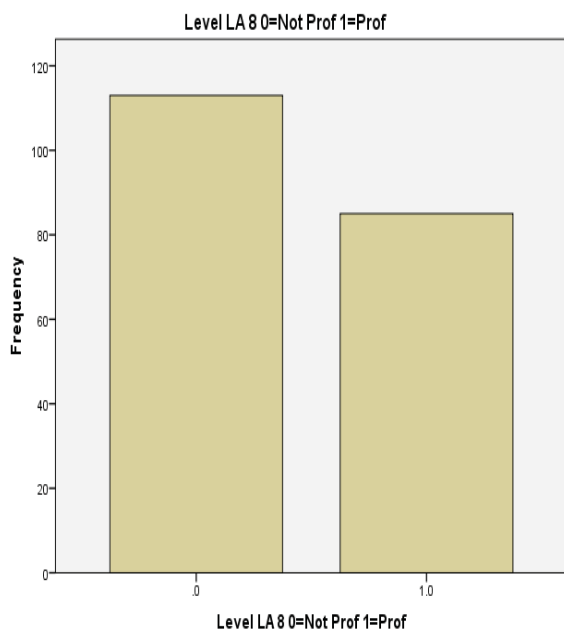


Figure 4: Change in proficiency.

## Binary Logistic Regression Analysis

Block 0 provides information about the baseline. The baseline is how well one can predict if a student will score in the proficient range without considering the predictor variables; SES, prior achievement, or special education classification. Block 1 includes the predictor variables of SES, prior achievement or special education classification. The first table under block 1 the classification table, and it indicates how well the combination of variables would predict if students would score at the proficient level on subsequent NYS examinations. Table 4 shows the percentage of correct predictions (57.1%) if all students were predicted to be in the larger (not proficient) group. Constant refers to all variables remaining the same.

Table 4

*Classification Table (a,b)*

		Predicted		
		Level LA 8 0=Not Prof 1=Prof		Percentage Correct
		.0	1.0	
Observed				
Level LA 8 0=Not Prof	.0	113	0	100.0
1=Prof	1.0	85	0	.0
Overall Percentage				57.1

- Constant is included in this model
- The cut value is .500

The variables in the equation table (see Table 5) shows that if one predicted that all students would end up scoring in the not proficient range, the odds of a successful prediction would be about the same as a chance, or 50-50. The column headers that appear in variables in the variables in the equation table are described below:

- B** - This is the coefficient for the constant (also called the *intercept*) in the null model.
- S.E.** - This is the standard error around the coefficient for the constant.

3. **Wald and Sig.** - This is the Wald chi-square test that tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called Sig.) is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0. Usually, this finding is not of interest to researchers.
4. **df** - This is the degrees of freedom for the Wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant.
5. **Exp(B)** - This is the exponentiation of the *B* coefficient, which is an odds ratio. This value is given by default because odds ratios can be easier to interpret than the coefficient, which is in log-odds units. This is the odds:  $85/113 = .752$  (Leech, Barrett, Morgan, 2011).

Table 5

*Variables in the Equation*

		<i>B</i>	<i>S.E.</i>	Wald	<i>df</i>	Sig.	Exp(B)
Step 0	Constant	-.285	.144	3.933	1	.047	.752

Table 6 show that only one of the three variables (previous achievement in English language arts) individually is a significant predictor of whether a student will score at the proficient level on a subsequent examination

Table 6

*Variables Not in the Equation*

			Score	<i>df</i>	Sig.
Step 0	Variables	SES0not1ED	1.192	1	.275
		LevelLA70NotProf1Prof	6.927	1	.008
		SPEDGENED0Gened1Spec	.508	1	.476
	Overall Statistics		8.823	3	.032

Table 7 shows that when all three predictors were considered together the model was significant ( $\chi^2 = 8.83$ ,  $df = 3$ ,  $N = 198$ ,  $p = .032$ ). In this study, the statistics for the Step, Model,

and Block were the same because a stepwise logistic regression was not used. The value given in the column is the probability of obtaining the chi-square statistic given that the null hypothesis is true. In other words, this is the probability of obtaining this chi-square statistic (8.832) if there is in fact no effect of the independent variables, taken together, on the dependent variable.

Table 7

*Omnibus Tests of Model Coefficients*

	Chi-square	df	Sig.
Step 1 Step	8.832	3	.032
Block	8.832	3	.032
Model	8.832	3	.032

Table 8 includes two different ways of estimating  $R^2$  or the percent of variance accounted for as is commonly done in multiple regression. The Cox & Snell  $R$  Square and Nagelkerke  $R$  Square are pseudo  $R$ -squares. These  $R$ -square estimates (.044 and .059) indicate that approximately 4 % and 6 % of the variance in whether students scored in the proficient range were predicted from a combination of the three independent variables.

Table 8

*Model Summary*

Step	-2 Log likelihood	Cox & Snell $R$ Square	Nagelkerke $R$ Square
1	261.681 <sup>a</sup>	.044	.059

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

**Conclusion**

The null hypothesis was accepted due to the fact that, individually, the strongest predictor of a student's likelihood of scoring in the proficient range on the eighth grade English language arts examination was achievement on the previous year's examination.

## Eighth Grade Math

Research question 2: How well does enrollment in a math academic intervention class during the 2012-2013 school year predict the odds of students scoring in the proficient range as measured by the New York State grade 8 math examination for the 2012-2013 school year?

Null Hypotheses 2: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 8 math examination for the 2012-2013 school year?

### Frequency Statistics

Among the categorical predictor variables for the eighth grade mathematics students, 26.8% of the population was not proficient on the seventh grade exam, which rose to 91.9% on the eighth grade mathematics examination. Conversely, the same group had a drop in its proficiency level from 73.2% in seventh to 8.1% in eighth grade (see Table 9).

Table 9

#### *Frequency Statistics for Categorical Predictor Variables Eighth Grade Students*

		Frequency	Percent	Valid Percent	Cumulative Percent
Math 7 <sup>th</sup> grade	Not Prof	53	26.8	26.8	26.8
	Proficient	145	73.2	73.2	100.0
	Total	198	100.0	100.0	
<hr/>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Math 8 <sup>th</sup> grade	Not Prof	182	91.9	91.9	91.9
	Proficient	16	8.1	8.1	100.0
	Total	198	100.0	100.0	

Figures 5 and 6 show the drop in the proficiency level from the seventh grade to the eighth grade in mathematics.

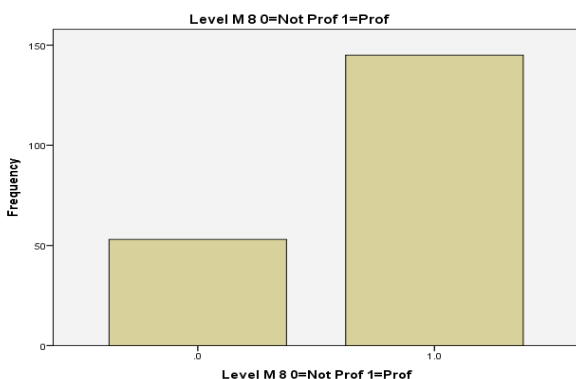


Figure 5. Change in proficiency.

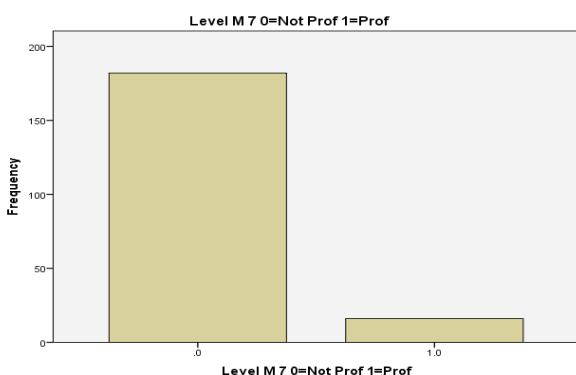


Figure 6: Change in proficiency.

### Binary Logistic Regression Analysis

Block 0 provided information about the baseline. The baseline is how well one can predict if a student will score in the proficient range without considering the predictor variables; SES, prior achievement, or special education classification. Block 1 includes the predictor variables of SES, prior achievement, or special education classification. The first table under block 1 is the classification table, and it indicates how well the combination of variables would predict if students would score at the proficient level on subsequent NYS examinations. Table 10 shows the percentage of correct predictions (73.2%) if all students were predicted to be in the larger (not proficient) group. Constant refers to all variables remaining the same.

Table 10

*Classification Table<sup>a,b</sup>*

Observed			Predicted		
			Level M 8 0=Not Prof 1=Prof		Percentage Correct
			.0	1.0	
Step 0	Level M8 0=Not Prof 1=Prof	.0	0	53	.0
		1.0	0	145	100.0
Overall Percentage					73.2

a. Constant is included in the model.

b. The cut value is .500

Table 11 shows that if one predicted that all students would end up scoring in the not proficient range, the odds of a successful prediction would be about the same as a chance or a 50-50. The column headers that appear in variables in the equation table are described below:

1. **B** - This is the coefficient for the constant (also called the "intercept") in the null model.
2. **S.E.** - This is the standard error around the coefficient for the constant.
3. **Wald and Sig.** - This is the Wald chi-square test that tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called "Sig.") is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0. Usually, this finding is not of interest to researchers.
4. **df** - This is the degrees of freedom for the Wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant.
5. **Exp(B)** - This is the exponentiation of the B coefficient, which is an odds ratio. This value is given by default because odds ratios can be easier to interpret than the coefficient, which is in log-odds units. These are the odds:  $145/53 = 2.74$  (Leech, Barrett, Morgan, 2011).



Table 11

*Variables in the Equation*

		<i>B</i>	<i>S.E.</i>	Wald	<i>df</i>	Sig.	Exp(B)
Step 0	Constant	1.006	.161	39.315	1	.000	2.736

Table 12 shows that only one of the four variables (previous achievement in mathematics) individually was a significant predictor of whether a student scored at the proficient level on a subsequent examination.

Table 12

*Variables not in the Equation*

			Score	<i>df</i>	Sig.
Step 0	Variables	SES0not1ED	.129	1	.720
		LevelLA70NotProf1Prof	1.361	1	.243
		SPEDGENED0Gened1Spec	2.177	1	.140
		LevelM70NotProf1Prof	6.362	1	.012
		LevelLA80NotProf1Prof	2.375	1	.123
	Overall Statistics		11.085	5	.050

Table 13 shows that when all three predictors were considered together, the model was significant ( $\chi^2 = 11.09$ ,  $df = 5$ ,  $N = 198$ ,  $p = .010$ ). In this study, the statistics for the Step, Model, and Block were the same because stepwise logistic regression was not used. The value given in the Sig. column is the probability of obtaining the chi-square statistic given that the null hypothesis is true. In other words, this is the probability of obtaining this chi-square statistic (15.091) if there is in fact no effect of the independent variables, taken together, on the dependent variable.

Table 13

*Omnibus Tests of Model Coefficients*

		Chi-square	df	Sig.
Step 1	Step	15.091	5	.010
	Block	15.091	5	.010
	Model	15.091	5	.010

Table 14 shows two different ways of interpreting  $R^2$ . The Cox & Snell  $R$  Square and Nagelkerke  $R$  Square are pseudo  $R$ -squares. In logistic regression these  $R$  values (.07 and .11) are estimates, and they indicate that approximately 7% or 11% of the variance of whether a student scores at the proficient level can be predicted from the linear combination of the three independent variables.

Table 14

*Model Summary*

		Cox & Snell $R$	Nagelkerke $R$
Step	-2 Log likelihood	Square	Square
1	214.959 <sup>a</sup>	.073	.107

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

**Conclusion**

The null hypothesis is accepted due to the fact that individually the strongest predictor of a student's likelihood of scoring in the proficient range on the eighth grade mathematics examination is achievement on the previous year's examination

### Seventh Grade English

Research question 3: How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 English language arts examination for the 2012-2013 school year?

Null hypotheses: Enrollment in an English academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 English language arts examination for the 2012-2013 school year?

### Frequency Statistics

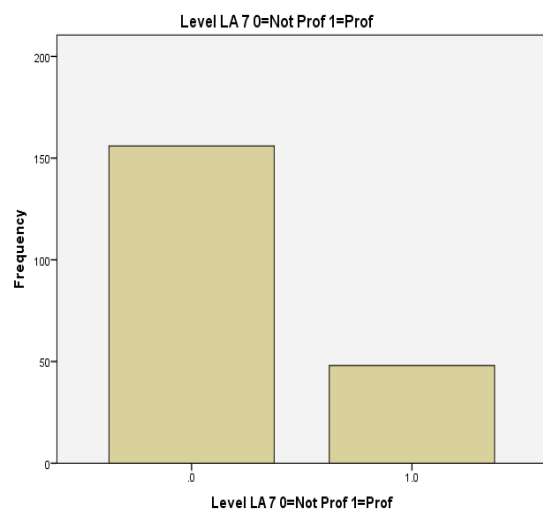
Among the categorical predictor variables for the seventh grade English language students, 43.6% of the population was not proficient on the sixth grade exam, which rose to 76.5% on the seventh mathematics examination. Conversely, the same group saw a drop in its proficiency level from 56.4% in seventh grade to 23.5% in eighth grade (see Table 15).

Table 15

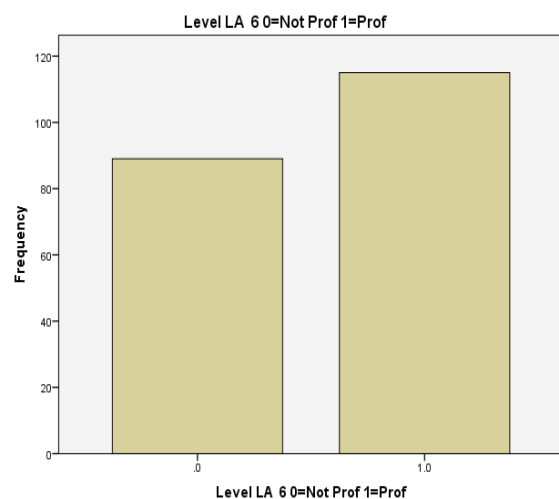
*Frequency Statistics for Categorical Predictor Variables Seventh Grade Students*

		Frequency	Percent	Valid Percent	Cumulative Percent
Language Arts 6 <sup>th</sup> grade	Not Prof	89	43.6	43.6	43.6
	Proficient	115	56.4	56.4	100.0
	Total	204	100.0	100.0	
		Frequency	Percent	Valid Percent	Cumulative Percent
Language Arts 7 <sup>th</sup> grade	Not Prof	146	76.5	76.5	76.5
	Proficient	48	23.5	23.5	100.0
	Total	204	100.0	100.0	

Figures 7 and 8 show the drop in the proficiency level from the sixth grade to the seventh grade in the English language arts.



*Figure 7:* Change in proficiency.



*Figure 8.* Change in proficiency.

### Binary Logistic Regression Analysis

Block 0 provides information about the baseline. The baseline is how well one can predict if a student will score in the proficient range without considering the predictor variables; SES, prior achievement, or special education classification. Block 1 includes the predictor

variables of SES, prior achievement, or special education classification. The first table under block 1 is the classification table, and it indicates how well the combination of variables would predict if students would score at the proficient level on subsequent NYS examinations. Table 17 shows the percentage of correct predictions (76.5%) if all students were predicted to be in the larger (not proficient) group.

Table 16

*Classification Table<sup>a,b</sup>*

Observed			Predicted		
			Level LA 7 0=Not Prof 1=Prof		Percentage Correct
			.0	1.0	
Step 0	Level LA 7 0=Not Prof	.0	156	0	100.0
	1=Prof	1.0	48	0	.0
Overall Percentage					76.5

a. Constant is included in the model.

b. The cut value is .500

Table 18 shows that if one predicted that all students would end up scoring in the not proficient range, the odds of a successful prediction would be about the same as a chance or a 50-50. The column headers that appear in variables in the equation table are described below:

1. **B** - This is the coefficient for the constant (also called the "intercept") in the null model.
2. **S.E.** - This is the standard error around the coefficient for the constant.
3. **Wald and Sig.** - This is the Wald chi-square test that tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called "Sig.") is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0. Usually, this finding is not of interest to researchers.
4. **df** - This is the degrees of freedom for the Wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant.

5. **Exp(B)** - This is the exponentiation of the B coefficient, which is an odds ratio. This value is given by default because odds ratios can be easier to interpret than the coefficient, which is in log-odds units. This is the odds:  $48/156 = 3$ .

Table 17

*Variables in the Equation*

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.179	.165	50.993	1	.000	.308

Table 19 shows that only one of the three variables (previous achievement in English language Arts) individually was a significant predictor of whether a student scored at the proficient level on a subsequent examination

Table 18

*Variables not in the Equation*

			Score	df	Sig.
Step 0	Variables	SES0not1ED	.021	1	.885
		LevelLA60NotProf1Prof	21.530	1	.000
		SPEDGENED0Gened1Spec	.331	1	.565
	Overall Statistics		21.923	3	.000

The results found in the Omnibus Tests of Model Coefficients table (See Table 20) suggest that when ~~we consider~~ all three predictors together the model is significant. ( $\chi^2 = 24.17$ ,  $df = 3$ ,  $N = 204$ ,  $p = .000$ ) The column headers that appear in Omnibus Tests of Model Coefficients below are chi square, degrees of freedom (df) and significance (sig). In this study, the statistics for the Step, Model and Block are the same because ~~we have not used~~ stepwise logistic regression. The value given in the Sig. column is the probability of obtaining the chi-square statistic given that the null hypothesis is true. In other words, this is the probability of

obtaining this chi-square statistic (24.171) if there is in fact no effect of the independent variables, taken together, on the dependent variable.

Table 19

*Omnibus Tests of Model Coefficients*

		Chi-square	df	Sig.
Step 1	Step	24.171	3	.000
	Block	24.171	3	.000
	Model	24.171	3	.000

The model summary (table 21) includes two different ways of interpreting  $R^2$ . The Cox & Snell R Square and Nagelkerke R Square are pseudo R-squares. In logistic regression these R values (.112 and .168) are considered estimates and indicate that approximately 11% or 17% of the variance of whether a student scores at the proficient level was predicted from the linear combination of the three independent variables.

Table 20

*Model Summary*

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	198.432 <sup>a</sup>	.112	.168

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

## Conclusion

The null hypothesis is accepted due to the fact that individually the strongest predictor of a student's likelihood of scoring in the proficient range on the seventh grade English language arts examination was achievement on the previous year's examination.

## Seventh Grade Math

Research question 4: How well does enrollment in a math academic intervention class during the 2012-2013 school year predict the odds of students scoring in the proficient range as measured by the New York State grade 7 math examination for the 2012-2013 school year?

Null hypotheses: Enrollment in a math academic intervention class does not have a statistically significant influence on the odds of students scoring in the proficient range as measured by the New York State grade 7 math examination for the 2012-2013 school year?

### Frequency Statistics

Among the categorical predictor variables for the seventh grade mathematics students, 32.8% of the population was not proficient on the sixth grade exam, which rose to 88.7% on the seventh mathematics examination. Conversely, the same group saw a drop in its proficiency level from 67.2% in seventh grade to 11.3% in eighth grade (see Table 22).

Table 21

#### *Frequency Statistics for Categorical Predictor Variables Seventh Grade Students*

		Frequency	Percent	Valid Percent	Cumulative Percent
Math 6 <sup>th</sup> grade	Not Prof	67	32.8	32.8	32.8
	Proficient	137	67.2	67.2	100.0
	Total	204	100.0	100.0	
<hr/>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Math 7 <sup>th</sup> grade	Not Prof	181	88.7	88.7	88.7
	Proficient	23	11.3	11.3	100.0
	Total	204	100.0	100.0	

Figures 9 and 10 show the drops in the proficiency levels from the sixth grade to the seventh grade in the mathematics.



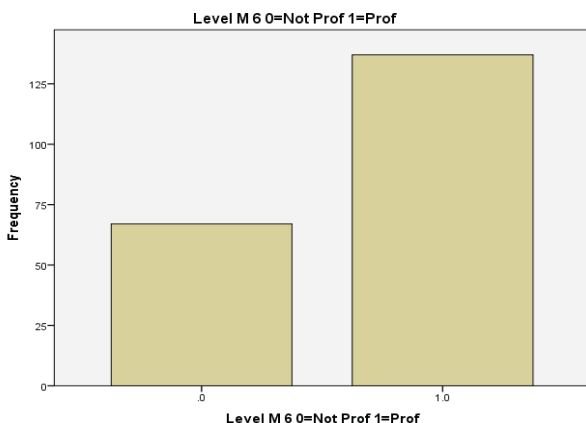


Figure 9. Change in proficiency.

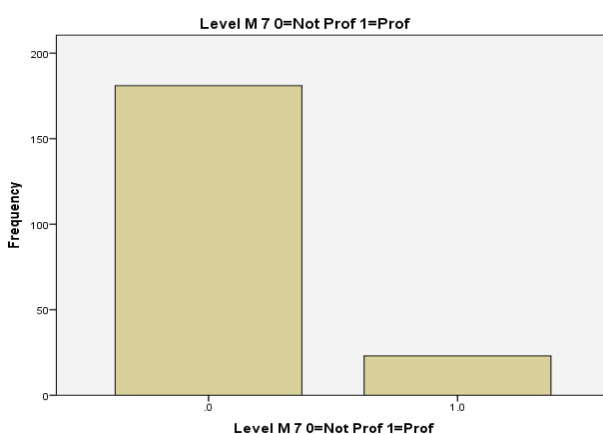


Figure 10: Change in proficiency.

## Binary Logistic Regression Analysis

Block 0 provides information about the baseline. The baseline is how well one can predict if a student will score in the proficient range without considering the predictor variables; SES, prior achievement or special education classification. Block 1 included the predictor variables of SES, prior achievement, or special education classification. Table 22 shows how well the combination of variables would predict if students would score at the proficient level on subsequent NYS examinations. Table 23 shows the percentage of correct predictions (88.7%) if all students were predicted to be in the larger (not proficient) group. Table 24 shows

that if one predicted that all students would end up scoring in the not proficient range, the odds of a successful prediction would be about the same as a chance, or 50-50.

Table 22

*Classification Table<sup>a,b</sup>*

Observed		Predicted		
		Level M 7 0=Not Prof 1=Prof		Percentage Correct
		.0	1.0	
Step 0	Level M 7 0=Not Prof 1=Prof .0	181	0	100.0
	1.0	23	0	.0
Overall Percentage				88.7

a. Constant is included in the model.

b. The cut value is .500

Table 24 shows that if one predicted that all students would end up scoring in the not proficient range, the odds of a successful prediction would be about the same as a chance, or 50-50. The column headers that appear in variables in the equation table are described below:

1. **B** - This is the coefficient for the constant (also called the "intercept") in the null model.
2. **S.E.** - This is the standard error around the coefficient for the constant.
3. **Wald and Sig.** - This is the Wald chi-square test that tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called "Sig.") is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0. Usually, this finding is not of interest to researchers.
4. **df** - This is the degrees of freedom for the Wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant.
5. **Exp(B)** - This is the exponentiation of the *B* coefficient, which is an odds ratio. This value is given by default because odds ratios can be easier to interpret than the coefficient, which is in log-odds units. This is the odds:  $48/156 = 3.08$

Table 23

*Variables in the Equation*

		<i>B</i>	<i>S.E.</i>	Wald	<i>df</i>	Sig.	Exp(B)
Step 0	Constant	-2.063	.221	86.851	1	.000	.127

Table 25 shows that only one of the four variables (previous achievement in mathematics) individually was a significant predictor of whether a student scored at the proficient level on a subsequent examination

Table 24

*Variables Not in the Equation*

			Score	<i>df</i>	Sig.
Step 0	Variables	SES0not1ED	.026	1	.872
		SPEDGENED0Gened1Spec	.242	1	.622
		LevelLA60NotProf1Prof	.000	1	.988
		LevelM60NotProf1Prof	9.543	1	.002
	Overall Statistics		10.135	4	.038

Table 26 shows that when all three predictors are considered together the model was significant ( $\chi^2 = 13.224$ ,  $df = 3$ ,  $N = 204$ ,  $p = .010$ ). In this study, the statistics for the Step, Model, and Block were the same because stepwise logistic regression was not used. The value given in the Sig. column is the probability of obtaining the chi-square statistic given that the null hypothesis is true. In other words, this is the probability of obtaining this chi-square statistic (13.224) if there is in fact no effect of the independent variables, taken together, on the dependent variable.

Table 25

*Omnibus Tests of Model Coefficients*

		Chi-square	df	Sig.
Step 1	Step	13.224	4	.010
	Block	13.224	4	.010
	Model	13.224	4	.010

Table 27 includes two different ways of interpreting  $R^2$ . The Cox & Snell  $R$  Square and Nagelkerke  $R$  Square are pseudo  $R$ -squares. In logistic regression these  $R$  values (.063 and .124) are considered estimates, and they indicated that approximately 6% or 12% of the variance of whether a student scores at the proficient level was predicted from the linear combination of the three independent variables.

Table 26

*Model Summary*

Step	-2 Log likelihood	Cox & Snell $R$ Square	Nagelkerke $R$ Square
1	130.480 <sup>a</sup>	.063	.124

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

**Conclusion**

The null hypothesis is accepted due to the fact that individually the strongest predictor of a student's likelihood of scoring in the proficient range on the seventh grade mathematics examination is achievement on the previous year's examination.

## **CHAPTER V**

### **CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH AND PRACTICE**

#### **Summary**

With state and federal agencies monitoring student achievement, it has become necessary to design support systems to improve how well students will perform on state mandated examinations in their current educational environment. The school improvement redesign efforts might provide information that might then allow other educators to adjust programs and pinpoint areas of need for their students. In this study the only predictor variable that was found to be statistically significant was previous achievement on earlier examinations. My purpose for this correlational, quantitative, explanatory study was to determine the efficacy of the academic intervention classes in one school district, as measured by the New York State seventh and eighth grade English language arts and math examinations. By seeking to determine whether the mere attendance at these additional instructional sessions, irrespective of who taught them, improved the odds of those students achieving the proficient level on state mandated tests in grades 7 and 8, I developed a good basis for future research and make sound educational decisions when planning student schedules. With the results of the study showing that previous achievement on examinations is the strongest predictor of success on subsequent examinations; administrators may want to adjust the focus of their efforts for future learning by connecting students' individualized curriculums to their past shortcomings. In all cases seventh and eighth grade math and science achievement was best predicted by the students' previous achievement.

These results suggest that despite being present in an academic intervention or basic skills class, a student might not improve his or her chances of scoring in the proficient range on

subsequent examinations. Although attendance certainly brings the students into contact with the content, it does not assure that they will improve their performance on future state mandated examinations.

## **Findings**

### **Research Question 1**

How well does enrollment in a 2012-2013 English academic intervention class predict the odds of its participating students scoring in the proficient range as measured by the New York State grade 8 English language arts examination for the 2012-2013 school year?

There was no statistically significant influence found between attendance in an English language arts academic intervention class and the odds of a student scoring proficient on the subsequent New York State grade 8 English language arts examination. The only statistically significant relationship was achievement on the previous year's English language arts examination.

### **Research Question 2**

How well does enrollment in a math academic intervention class during the 2012-2013 school year predict the odds of students scoring in the proficient range as measured by the New York State grade 8 math examination for the 2012-2013 school year?

There was no significant difference found between attendance in an academic intervention class and predicting the odds of a student scoring in the proficient range on the New York State grade 8 mathematics examination. Again, the only significant predictor of a student scoring in the proficient range on the New York State grade 8 mathematics exam was achievement on the previous year's examination.

**Research Question 3**

How well does enrollment in an English academic intervention class predict the odds of students scoring in the proficient range as measured by the New York State grade 7 English language arts examination for the 2012-2013 school year?

There was no statistically significant difference found between attendance in an academic intervention class and predicting the odds of a student scoring in the proficient range on the New York State grade 7 English language arts examination. The only statistically significant predictor of a student scoring in the proficient range on the New York State grade 7 English language arts exam was achievement on the previous year's examinations.

**Research Question 4**

How well does enrollment in a math academic intervention class during the 2012-2013 school year predict the odds of students scoring in the proficient range as measured by the New York State grade 7 math examination for the 2012-2013 school year?

The results for research question 4 were similar to those of the previous three questions. There was no statistically significant difference found between attendance in an academic intervention class and predicting the odds of a student scoring in the proficient range on the New York State grade 7 mathematics examination. The only significant predictor of a student scoring in the proficient range on the New York State grade 7 mathematics exam was achievement on the previous year's examinations.

The goal of the academic intervention program in the school was to increase the number of students who scored in the proficient range on subsequent examinations. The implementation of testing mandates has put public school personnel across New York State and the country under an enormous amount of pressure to raise the level of standardized test scores in their

buildings and districts. In addition, New York State requires that school districts offer these classes, and that the students with the poorest performance on the examinations be placed in them. The state does not provide a set curriculum for the classes; therefore, the types of activities that exist in them can vary widely.

In order to begin to add to the limited research on the topic, I felt it was best to start at the most basic level, attendance. Does attendance at the classes have an impact on student performance for those who are enrolled in the classes? The results were interesting, but not unexpected. When looked at individually, student attendance was not a significant predictor of student performance on subsequent examinations. However, when all three factors were observed as a group (SES, previous achievement, and special education status) the model was significant. With the whole model being statistically significant, attendance might play a role in students' success on subsequent examinations when paired with other factors.

It may seem obvious that students must do more than simply show-up in order to improve their chances of scoring in the proficient range on an examination, but there is value knowing that it is not enough to just schedule the classes and assign students to them without setting goals or a curriculum. Further research beyond this study should be more targeted on the instructional practices employed by the teachers teaching the AIS classes, and investigate whether there is a significant impact related to certain practices.

### **Implications**

Although the results from this study did not show a significant influence of attendance in the AIS program, the results suggest that the building administration in the school think that the program is working and that students do get some value. The school administration did state that with some tweaking and refinement of the content and teaching modalities the classes would



become even more valuable. The results of the study were shared with the school building and district, and the administrators took the results as an opportunity to look into different types of programs in order to modify the options being offered.

### **Limitations**

The limitations to this study include the student population being studied, the lack of focus on the teaching strategies being used, and the exclusive examination of enrollment in the classes.

The results is not generalizable to the rest of New York State. The makeup of the school was upper middle class and located in a fairly wealthy neighborhood. The students tended to have good life experiences that included access to travel and cultural opportunities. These qualities are not necessarily qualities found in the majority of students throughout New York State. The results from this study reflect one type of student. Generalizing is cautioned and more research should be conducted before making any sweeping programmatic changes in any school building

By focusing on attendance I was trying to get a baseline reading of whether there was value in the classes. There was no focus on the strategies being used by the teacher or the personalities of the teachers themselves. If the classes were looked at more closely and the strategies being employed by the teachers were scrutinized, I may have found a connection between success on the New York State exams and the strategies being employed in the AIS class or the even individual teachers themselves. Future study should dig deeper into the strategies being used and the type of person teaching the classes.

Finally, this study did look at attendance, but it did not break down the attendance day by day. I looked to see if the student was enrolled in the class and attending. The school has a very

high attendance rate and attendance is not a problem. However, if I did break attendance down to daily increments I could have seen if there was a statistically significant impact on the students' subsequent test scores.

### **Recommendations for Practice and Policy**

Although the results of the study are clear, they are not surprising. At present, there is no quick fix for improving student performance on state mandated examinations. Any improvements to student performance will be the result of incremental changes that are supported with up-to-the-minute data specific to the school where the change process is being implemented. The focus of data-driven reform in education is designed to identify and understand the root causes of the scores of the students and to use those root causes to develop an appropriate curriculum based on the needs of the students. Once the data is collected, the idea is to focus resources and efforts to make the biggest impact in an educational setting. A practical recommendation from this study might be to simply take a look at how content is delivered in the AIS classes. Yes, attendance in the classes is important, but how and what the students are learning in the classes might be equally important. Through a formative approach, schools would be able to individually tailor the content that is delivered on a more individualized basis. Additionally, administrators may be able to look at students' previous year's scores on New York State examinations and then create leveled AIS classes to accommodate the needs of the students more specifically. Although my study did not delineate between special education and regular education students, the school should look at the remedial classes that are being offered to help the special education population of the school. The strategies in these classes might be a good starting point for the school to look at when developing a curriculum for the academic intervention classes. It may even be possible to have a special education teacher, or

regular education teachers with a significant background in special education, teach more of the regular education AIS classes. This may help the students because the special education teachers are already trained in strategies to develop the needed skills.

Almost as important as assigning the students correctly and delivering the right content by a capable teacher, school officials should take a multiple measures approach to get a better sense of the AIS program's effectiveness. Through this multiple measures approach the administrators can look at various data from different sources. The most basic source of data is the scores on the exams, but administrators could find value in the perceptions of the students taking the classes. Through a fairly simple survey, students would be able to share what they feel are the positive and negative aspects of the classes. If the students feel that their suggestions are being heard, they may be more motivated to do well. Finally, administrators may want to take a closer look at the test scores and break them down by individual teachers. If one teacher clearly has a higher success rate than the others, the administration may be able to set some common planning time for the teachers to work together to develop best practices.

New York State mandated that these academic intervention classes be offered, and that any student who scored below a certain score on assessments be placed into the classes. With that being said, the state offered little support in terms of curriculum or guidance about the classes. The school administration might benefit by doing a disaggregate analysis of the previous year's exam to determine which areas the students struggled in the most. Then building principals could formulate a curriculum plan around those specific areas. In order to monitor the progress that students are making, the schools should develop an academic skills tracking system. These documents, not too dissimilar from an IEP or a 504 plan, could be used to monitor student progress in their academic areas of need. The sheets would be managed by

teachers to facilitate communication between classes and give the teachers an idea of what skills to incorporate into their lessons. Once the skills tracking forms are completed, the school may even be able to reduce the number of AIS classes, if the students areas of need are being addressed by their content teachers.

Reflecting back on Carroll's (1993) *Model for School Learning*, principals should do an assessment of time spent on task in the AIS classes. . Carroll's model suggests that there is time within the school day that does not get utilized properly. If the principals worked with the AIS teachers to maximize the instruction and task time within the AIS classes, they might be able to reduce the overall amount of time that is needed for the classes themselves and possibly pair the AIS classes up with other classes. This formula would free up time in the students schedule for more opportunity to study other subjects such as the arts.

By making a sweeping decision to place every student who scored below a certain range in an academic intervention class, the state took away local control of the education process from the schools. Local school and school district administrators know their students best and should be charged with finding the best ways to reach them educationally. Going forward the state should consider giving some control over how to manage student results back to the school districts. Students from different areas with different backgrounds and different socio economic levels respond differently to interventions. What works in Buffalo may not work in Westchester County. When looking at improving scores, state bureaucrats should make recommendations rather than mandates and allow the local building and district leaders more leeway in making programmatic decision for their students. Local leaders understand the nuances of their district best and understand which programs might be most successful, given the state of their district. There may be a rise in the number of ELL students that might benefit from additional ESL

teachers or the financial constraints might be such that adding AIS classes is not feasible, but adding small group sessions with teaching aids might achieve the desired result. In either case, programmatic control is left to the building and district leaders, and parents should be able to choose the direction that they feel is best for their child.

### **Recommendations for Future Research**

There have been a limited number of studies that evaluated the effectiveness of supplemental education services, and the studies that have been conducted primarily focused on after-school programs rather than programs that are run during the regular school day. Smith, Roderick, and Degener (2005) found that after school programs can be successful with some age groups, but unsuccessful with others. The results of this study were mixed. The study analyzed third, sixth, and eighth graders. The third graders who were enrolled in the after school program had much better achievement results than the sixth or eighth graders. This suggests that as students become older the program loses its effectiveness. Furthermore, academic intervention programs are not created equally adapted to culturally diverse students, and results may vary from year to year depending on the population of students that are being taught. With that being said, additional study is needed to analyze both the successful and unsuccessful pedagogical methods being used in the academic intervention classes.

This research study was intended to investigate whether attendance in an academic intervention class had an impact on students' chances of scoring in the proficient range on subsequent examinations. Independently, attendance is not a strong indicator of future success, but coupled with previous achievement and socio-economic level it did have a role. Poor attendance may affect a student who comes from a low socio-economic background because low SES students are less likely to have the cultural experiences at home and assistance with their

studies when they are not in school. Although it is the weakest of the three indicators, it might play a role. It can be argued from the results that the lower SES student is better off being present in the class, rather than not being present. Future researchers should dive deeper into the attendance question to explore, for example, the relationship between exciting pedagogy and attendance and weak pedagogy and non-attendance. Additionally, future researchers might consider taking a more qualitative look at AIS classes and determine if there is a connection between academic achievement and the students' relationships with the teachers or the support staff. This study focused on student enrollment in AIS classes and did not break down daily attendance. The school studied has an attendance rate in the high 90 percent range. Most of the students in this school come to school; attendance is not a problem. That is not to say that there could be some minor inconsistencies in attendance that could have an effect on the students that will score in the proficient range on future New York State examinations. A future study could look at daily attendance and do a logistic regression to determine if there is a more significant relationship.

A more qualitative approach to this topic may be a study that focuses on motivational factors for students who do not do well on these exams. It can be argued that when students do poorly on exams they begin to lose motivation due to their lack of previous achievement. On the other-hand, students who are successful on the state mandated exams may be more motivated to do well because they have demonstrated success on the exams before. In either situation, one can see a connection to what was discovered in this study, that the biggest indicator of future success is how well a student has done on earlier state examinations.

Many times the extra AIS classes are squeezed into students' schedules and take the place of classes that might be more enjoyable for the students, such as art, music, or an elective.

Although the intention of the scheduled class is to help the student, there may be an opposite effect because the student may feel that he or she is being punished because of past performance. If the student does feel as if he or she is being punished for past performances, he or she can lose motivation or just give up all together. The student's motivation may be compromised even more when one considers the makeup of the AIS classes. The AIS classes are entirely made up of students who struggle, but struggle with various types of tasks. For instance, one may have one student who reads below grade level, but wants to succeed, sitting next to a student who struggles with finding value in going to school and puts forth little effort. These two students both struggle and both may perform poorly on state mandated exams. However, the student who has a clear desire to succeed may be negatively impacted by the student who does not have as strong of a desire.

Again, it is important to point out that this study involved one middle school in a fairly affluent town in New York State. The town, in general, has had a rise in the ELL population and the challenges that come with that, including changing the traditional set-up of the school. The student body of the school is not necessarily reflective of the greater population in schools across the state. Future studies on this topic should consider using a wider ranging population to get more generalizable results. The results of a state-wide study or a study that focused more on urban school populations may have a greater impact and relevance to more schools and school districts. In general, urban districts spend large amounts of money on these types of academic intervention services and may benefit greatly from a study that analyzes the effectiveness of the classes being offered in their districts.

## Conclusion

There is still value in the findings. Not surprisingly, attendance does play a role in the success of a student. By identifying that being enrolled in the classes does have a small effect and, when coupled with the other two factors (previous achievement and special education status), it has a statistically significant effect, I have found value and created a starting point for future research.

Attendance alone is statistically insignificant; therefore, school leaders should take a closer look at the academic intervention classes that are being offered. It is not enough to simply offer these classes based on the fact that the state requires them. Just filling a need without actually addressing the problem accomplishes nothing, and this study has proven that. Scheduling students in to the classes has little effect on their performance. Districts would be better off scheduling these classes with teachers who have the skills necessary to deliver the content, and the skills that the students need in order to be successful on the state mandated examinations. In the building where this study was conducted there was a wide range of scores in the not proficient range. These students were all grouped together and then scheduled in to the classes based upon who fit, rather than their needs. If the students were grouped based on their scores and the classes were developed based upon the students needs, there may be a better likelihood that the students would see improvement in their performances. For instance, if teachers have all of the students who scored just below the cutoff in one class and those who scored well below the cutoff in another, the teachers would be able to modify the curriculums to better suit the students' needs. This type of program may not only put the borderline students in a better position to be successful, it would give the lower scoring students an opportunity to move their score up by learning the more basic skills that they are lacking. The current one-



size-fits-all model is nothing more than a placeholder and requirement filler in the students' schedules and does not address the actual problem. The current model, in my opinion, is a waste of resources that could be better spent elsewhere. Why would a school run a program that is clearly not working? Specific to this school, the program is not meeting the needs of the population. It is quite possible that the traditional set up of the school is no longer what is needed for the changing population of the town. An increase in English language learners has created a need for more ESL teachers. The struggling population may show improved performance as a group if the population has access to more ESL resources.

Looking at the results of the study from the perspective of the state education department, the results should be eye opening. Although I believe the decision makers at the state level are trying to do the right thing for the students, they are not necessarily going about it in the correct way. The blanket mandate that schools must provide additional support for these students is not a bad thing, but the mandate is not working. The state should take a look at the requirements of the mandate. The schools are not required to submit curriculum for the classes and have the freedom to schedule these classes in any fashion they want. The school that this study was conducted in chose to have the classes squeezed in to the regular school day and taught by staff that already existed. This essentially added up to a wasted period for the students who would have otherwise been able to take a class that would have more value to them, both personally and educationally. Going forward it may be wise for future research to determine which format yields the best results for student success and recommend that program for schools when they are adding AIS programs. Additionally, the state may want to develop a curriculum for AIS classes that provides a road map for the teachers that are tasked with teaching the classes. There are also numerous web-based options available to provide additional support to students. The state

should consider evaluating these programs and publishing their recommendations on which ones are most in line with the skills that the standardized tests are measuring. It is also not unheard of a state selecting a few different companies to design programs that specifically address individual state needs rather than the educational needs of the entire country.

In closing, future research is necessary, but in an educational climate where funding is sparse and accountability is high, it makes little sense to continue programs that are clearly not working. School district and building leaders should focus their resources on programs that have a research-based success rate. Just scheduling students in academic intervention classes to satisfy a mandate does the students little good. We owe it to our learners to provide them with the best opportunities to be successful.

From a personal standpoint, this study has helped to reinforce my view on educational leadership. I have always viewed myself as an educational leader who looks at every situation independently of any other situations. I have always viewed the one-size-fits-all mentality as a weak leadership characteristic and this study has confirmed that for me. The state of education in the United States is in flux. There are a lot of cooks in the kitchen and they all have different recipes for success. I, for one, feel we, as a country, should leave the governing to the politicians, the educating to the educators, and, of course, the cooking to the cooks. Good educational leaders pride themselves in making sound data-based decisions and not getting tied up in the emotion of the moment. In the data age, good decision-making is getting easier and easier every day. I can only hope this study is a positive addition to information available. Policy makers should start to spend more time in the school talking with building and district leaders to learn what works and what does not. It becomes the job of the district and building

administrators to show the policy makers what works, so that they make more informed decisions when creating policy.

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## **Appendix A**

Request to Conduct Educational Research, Studies and/or Surveys  
Clarkstown Central School District

**Request to Conduct Educational Research, Studies and/or Surveys**  
**Clarkstown Central School District**

Please complete the following and forward to the Associate Superintendent for Elementary Education, the Associate Superintendent for Secondary Education or the Associate Superintendent for Pupil Services, Clarkstown Central School District, 62 Old Middletown Rd., New City, NY 10956, at least one month prior to the start of the proposed survey.

---

**Name of Applicant:** Andrew Trust

**Title:** Assistant Principal of Pearl River High School

**Organization Applicant Represents:** Seton Hall University

**Description of Organization:** Post-Secondary institution

**Business Address:**

Seton Hall University

Department of Educational Leadership

Jubilee Hall

400 South Orange Avenue

South Orange, NJ 07079

**Telephone Number:** (973) 761-9000

**Subject:** A statistical study of the impact of increased instructional time in mathematics and language arts on underperforming student's subsequent achievement scores in eighth grade mathematics and English language arts.

**Procedures:** As a result of new regulations passed by New York State students who scored below the proficient range on the NYS Math or English Language Arts 8 classes are required to be scheduled in Basic Skills Classes with the intent to help them improve their scores on the subsequent examinations. These classes have existed in school districts across the state for years, but the curriculum is not uniform. I will use a logistic regression that will account for outside factors that may influence student achievement in order to focus on the in-school variable of their attendance in these classes and the relationship to their scores on the New York State seventh and eighth grade examination. If permission is granted, I will need access to scheduling information, demographic information and NYS 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grade ELA and Math Scores for all students at Felix Festa Middle School. I am not asking for nor will I use information that could identify any student. Prior to conducting the research the proposal must be approved by the University Institutional Review Board to ensure that no individuals can be identified from the information. Additionally, the school district (CCSD) will not be referred to by name or location, just simply as a large middle school in New York State.

**Purpose:** The purpose of this study is to determine if there is an increased chance of a student scoring in the proficient range on the NYS Math or ELA 7<sup>th</sup> or 8<sup>th</sup> grade exams after being enrolled in the BSI/AIS/Labs for the school year prior to taking the NYS examinations. The study does not take into consideration the type of instruction that is being offered in the classes since there is no curriculum designed by NYS. Presently there is little research on whether these additional instructional sessions actually increase the chance of those enrolled to score in the proficient range on their subsequent state exams. My study seeks to answer this question, at least for students at Felix Festa Middle School. The

results of the study will provide some evidence concerning the impact of these classes both to the school and district administrators of Felix Festa, as well as potentially provide policy makers better insight into the value of the BSI classes.

**People Involved:** Andrew Trust is the primary investigator, assisted by professors Robert Starratt and Christopher Tienken of the Seton hall University Faculty.

**Length of Time:** The study will begin when permission is granted by CCSD and the information is obtained from CCSD. The district will be provided a report at by January of 2015

**Information needed to complete the study:**

**2012-13 8<sup>th</sup> graders**

2012 – 7<sup>th</sup> grade ELA and Math Scale Scores

2012-13 – Scheduling information (AIS)

2013 – 8<sup>th</sup> grade ELA and Math Scale Scores

**2012-13 7<sup>th</sup> graders**

2012 – 6<sup>th</sup> grade ELA and Math Scale Scores

2012-13 - Scheduling information

2013 – 7<sup>th</sup> grade ELA and Math Scale Scores.

**Place:** The information will be saved on the personal computer of Andrew Trust and the research will be completed at home or at Seton Hall University. After completion of the study, the data will be stored in a secure place for three years then destroyed.

**People Conducting Research:** Andrew Trust

If there is anything more to help with your decision to grant permission to complete the study please just let me know.

**Contact information:**

Andrew Trust

1 Southerly Place

New City NY 10956

845-642-4042

Atrust77@gmail.com

## **Appendix B**

### Letter of District Approval for Study



**CLARKSTOWN CENTRAL SCHOOL DISTRICT**  
62 Old Middletown Road, New City, NY 10956

**J. Thomas Morton, Ed.D.**  
*Superintendent of Schools*

(845) 639-6418  
Fax: (845) 639-6488  
tmorton@ccsd.edu

April 28, 2014

Andrew Trust  
1 Southerly Place  
New City, NY 10956

Dear Andrew:

Your request to conduct educational research with data supplied by the Clarkstown Central School District has been approved, with the understanding that the names of Clarkstown students and the district will be kept anonymous. Please contact Neena Shaji to receive the information.

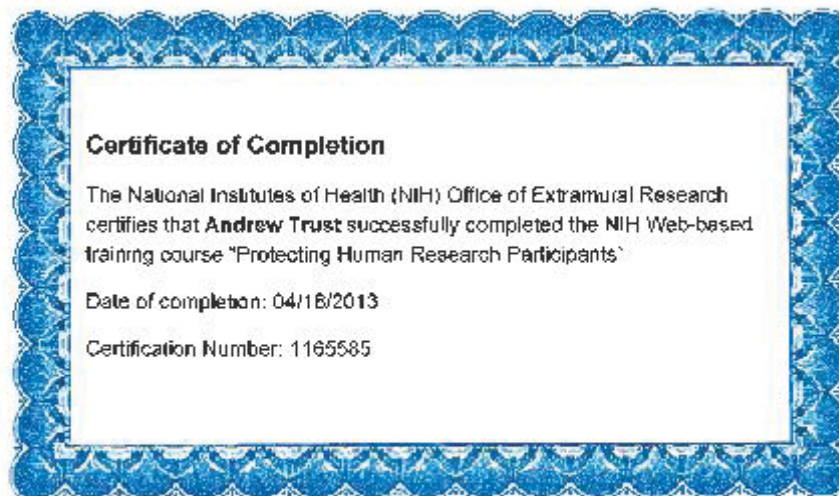
Sincerely,

A handwritten signature in black ink, appearing to read "J. Thomas Morton".

Dr. Thomas Morton  
Superintendent of Schools

## **Appendix C**

### **Human Participant Protections Education Completion Certificate**





## **Appendix D**

Approval for Dissertation Proposal



COLLEGE OF EDUCATION  
AND HUMAN SERVICES  
Promoting Professional Practice

## SETON HALL UNIVERSITY

### APPROVAL FOR DISSERTATION PROPOSAL

Candidate, Andrew Trust \_\_\_\_\_, has successfully completed all requisite requirements. This candidate's proposal has been reviewed and the candidate may proceed to collect data according to the approved proposal for dissertation under the direction of the mentor and the candidate's dissertation committee.

If there are substantive differences between what has been approved and the actual study, the final dissertation should indicate, on separate pages in the Appendix, the approval of the committee for those changes.

#### Title of Proposed Dissertation:

A statistical study of the impact of increased instructional time in mathematics and language arts on underperforming student's subsequent achievement scores in seventh and eighth grade mathematics and English language arts.

#### Dissertation Committee:

Dr. Robert Starratt \_\_\_\_\_  
Mentor (Print Name)

Robert Starratt 04-25-2014  
Signature/Date

Dr. Christopher Tienken \_\_\_\_\_  
Committee Member (Print Name)

Christopher Tienken 4-25-2014  
Signature/Date

Dr. Deborah Thomas \_\_\_\_\_  
Committee Member (Print Name)

Deborah Thomas (RGS) 04-25-2014  
Signature/Date

\_\_\_\_\_  
Committee Member (Print Name)

\_\_\_\_\_  
Signature/Date

\_\_\_\_\_  
Committee Member (Print Name)

\_\_\_\_\_  
Signature/Date

Approved by Seton Hall University Institutional Review Board on: \_\_\_\_\_

\_\_\_\_\_  
Department Chairperson

\_\_\_\_\_  
Signature/Date

Waived by IRB by: \_\_\_\_\_ on this date \_\_\_\_\_

## **Appendix E**

Request for Approval of Research, Demonstration or Related Activities Involving Human  
Subjects

# **REQUEST FOR APPROVAL OF RESEARCH, DEMONSTRATION OR RELATED ACTIVITIES INVOLVING HUMAN SUBJECTS**

All material must be typed.

**PROJECT TITLE:** A statistical study of the impact of increased instructional time in mathematics and language arts on underperforming student's subsequent achievement scores in seventh and eighth grade mathematics and English language arts.

**CERTIFICATION STATEMENT:**

In making this application, I/(we) certify that I/(we) have read and understand the University's policies and procedures governing research, development, and related activities involving human subjects. I/(we) shall comply with the letter and spirit of those policies. I/(we) further acknowledge my(our) obligation to (1) obtain written approval of significant deviations from the originally-approved protocol BEFORE making those deviations, and (2) report immediately all adverse effects of the study on the subjects to the Director of the Institutional Review Board, Seton Hall University, South Orange, NJ 07079.

Andrew Trust

RESEARCHER(S) OR PROJECT DIRECTOR(S)

DATE

\*\*Please print or type out names of all researchers below signature.  
Use separate sheet of paper, if necessary.\*\*

My signature indicates that I have reviewed the attached materials and consider them to meet IRB standards.

Dr. Robert Stamati  
RESEARCHER'S ADVISOR OR DEPARTMENTAL SUPERVISOR

DATE

\*\*Please print or type out name below signature\*\*

The request for approval submitted by the above researcher(s) was considered by the IRB for Research Involving Human Subjects Research at the May 2014 meeting.

The application was approved ☒ not approved ☐ by the Committee. Special conditions were ☐ were not ☒ set by the IRB. (Any special conditions are described on the reverse side.)

DIRECTOR,  
SETON HALL UNIVERSITY INSTITUTIONAL  
REVIEW BOARD FOR HUMAN SUBJECTS RESEARCH

DATE